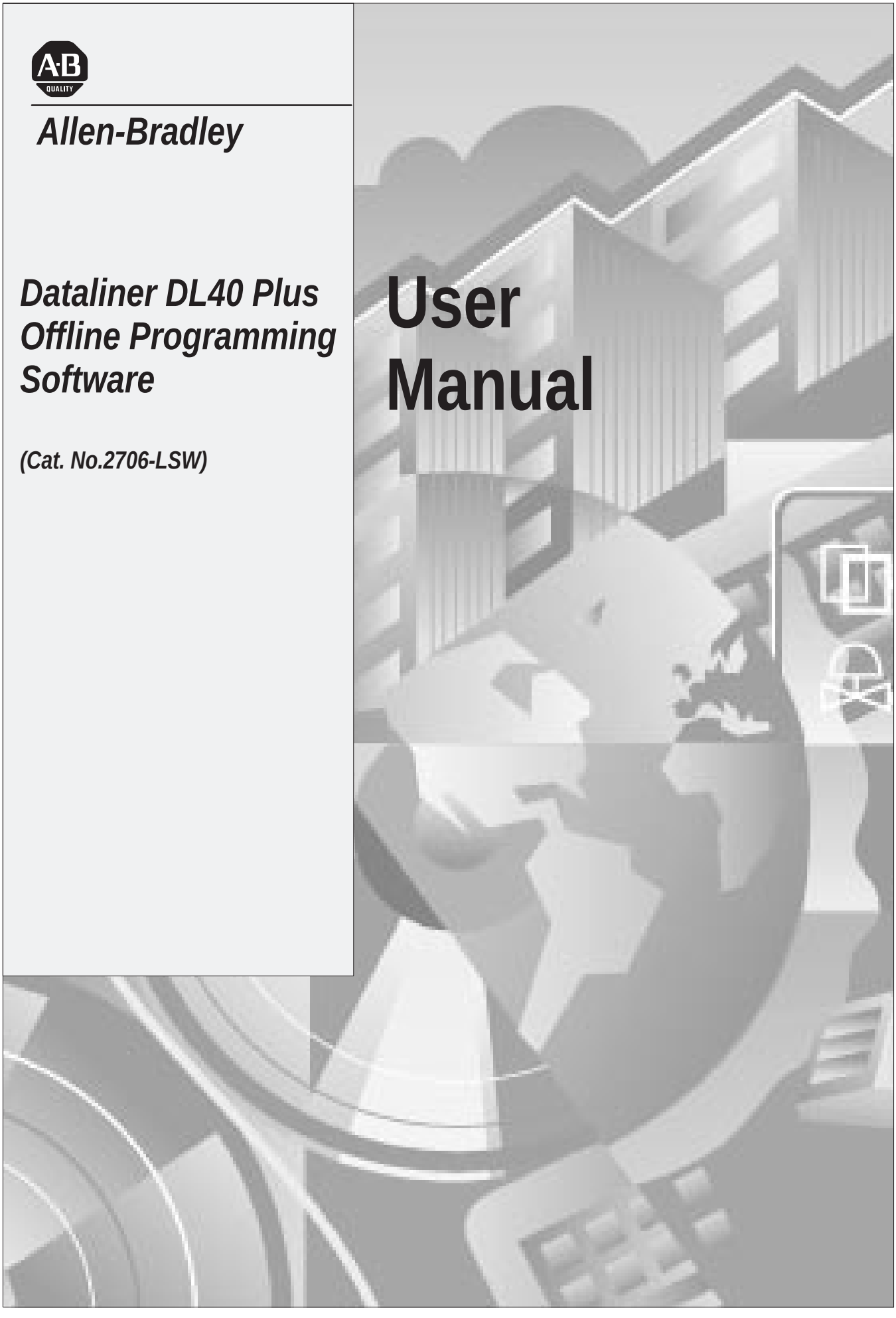
Allen-Bradley

Dataliner DL40 Plus Offline Programming Software

(Cat. No.2706-LSW)

User Manual



Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

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Throughout this manual we use notes to make you aware of safety considerations:

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

Important: Identifies information that is critical for successful

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Using this Manual

This preface provides an overview of the Dataliner DL40 Plus Offline Programming Software. The topics it covers include:

- What you need to know
- Contents of the manual
- Conventions used throughout the manual
- Related publications

What You Need to Know

No special knowledge is required to read this manual or use the DL40 Plus Offline Programming Software (Catalog No. 2706-LSW). However, you should be familiar with the operation of the DL40 Plus and how it will be integrated into your control system before trying to use the Offline Programming Software.

Contents of this Manual

This manual describes how to install and use the DL40 Plus Offline Programming Software. The manual is organized as follows:

Chapter	Title	Purpose
1	Overview of the DL40 Plus	Provides an overview of the DL40 Plus Message Display.
2	Installing the Software	Describes how to install the DL40 Plus Offline Programming Software.
3	Navigating the Software	Provides a description of the menus along with instructions for setting up and exiting the software.
4	Creating Message Files	Describes how to create and manage message application files.
5	Downloading/Uploading Message Files	Describes the contents and use of the Transfer menu.
6	Getting Reports	Describes the contents and use of the Reports menu.
7	Managing Message Files	Describes the contents and use of the Files menu.
Appendix A	Message Display Worksheets	Convenient forms for recording message contents.
Appendix B	Cables	Cable pinout diagrams
Appendix C	ASCII Character Sets	Summary of ASCII characters and their keyboard codes.
Appendix D	PLC-5 Pass-Through	Provides an application example of using PLC-5 data Pass-Through.

Conventions Used

The following conventions are used in this manual:

- All menus and screens reproduced in this manual approximate what you see when using the software.
- A symbol or word in brackets represents a single key that you press. These include keys such as [A] or [Del]. Since the Dataliner can be programmed with a variety of keyboards or terminals, the printing on your keyboard may be different from the symbol or word indicated in brackets.
- This manual uses ↵ to specify the carriage return function of a keyboard. On your keyboard this may correspond to an [ENTER], ↵ , or [Rtrn] key.
- The up caret, ^, is the symbol for a control character. For example: ^W is the symbol for a Control W character. On most computers this character is entered by pressing [Ctrl] and [W] simultaneously.
- In the following chapters, we refer to the Dataliner DL40 Plus Message Display as the DL40.

Related Publications

Other publications to which you may want to refer include:

- Dataliner DL40 Plus Message Display User Manual, (Publication 2706-6.1)
- Dataliner DL40 Plus Message Displays Release Note (provided with DL40 Plus display) is helpful if you are replacing an existing DL40 display with a DL40 Plus display.

Overview of the DL40 Plus

Chapter Objectives

This chapter describes key features and capabilities of the DL40 Plus. Understanding the capabilities allows you to use the Offline Programming Software more effectively. For more information, refer to the DL40 Plus user manual (Publication 2706-6.1).

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Available Configurations

The DL40 Plus is available in a 2- or 4-line configuration (capable of displaying 20 characters per line) with either Remote I/O or Parallel port communication options.

Remote I/O Version

The Remote I/O version enables two-way communications with the Allen-Bradley family of PLCs and SLCs. A remote I/O version of the DL40 Plus can appear to the PLC or SLC as any size I/O rack ($^1/_4$, $^1/_2$, $^3/_4$, or full).

Parallel Port Version

The Parallel Port version receives message number triggers, slave addresses, and variable data from a PLC or SLC output module via 16 data lines and 4 strobe lines (indicating the type of data).

RS-485/RS-232 Communications

Both the Remote I/O and Parallel Port versions have RS-485 and RS-232 ports. You can configure these ports for Programmer, DL Slave or Open Protocol communications (see table below). Port settings are modified through the Ports menu in the Offline Programming software or the Onboard Editor. You select a communication option under the Port Use submenu.

The RS-232 port always communicates with the Offline Programming Software regardless of the configured mode. Open Protocol or DL Slave operation can occur on either the RS-232 or RS-485 port.

If the RS-485 port is configured for Open protocol or DL Slave operation, you cannot configure the RS-232 port for the same protocol. Instead, an information message reports an invalid port configuration (Incompatible Port Usage).

Configurations	Description	DL40 Plus Port	Communication/Printing Options			
			Programmer	Open Protocol	Slave	Printing
1	Offline Programming and Serial Printing	RS–485	√			
		RS–232	√			√
2	RS-232 Offline Programming and RS-485 Message Triggering	RS–485		√		
		RS–232	√			√
3	RS-232 Offline Programming RS-485 Slave Communications	RS–485			√	
		RS–232	√			√
4	RS-485 Offline Programming RS-232 Message Triggering	RS–485	√			
		RS–232		√		
5	RS-485 Slave Communications RS-232 Message Triggering	RS–485			√	
		RS–232		√		
6	RS-485 Offline Programming RS-232 Slave Communications	RS–485	√			
		RS–232			√	
7	RS-485 Message Triggering RS-232 Slave Communications	RS–485		√		
		RS–232			√	

Note: Open protocol is a serial ASCII based format for triggering messages stored in the DL40 Plus displays. Open protocol supports message triggers with or without variable data over the RS-232 or RS-485 serial ports.

Message Support

The DL40 Plus stores messages of varying length. Each message is identified by a unique message number from 1 to 9999. Messages are placed in an internal memory queue when triggered by a command from your control system. They are then run according to attributes selected in the DL40 Plus.

The DL40 Plus can display a wide variety of characters and symbols, including:

- Uppercase letters
- Lowercase letters
- Punctuation
- Special characters from the English extended ASCII character set
- English character set (default)
- International character set ISO 8859–1
- Cyrillic character set (Russian)

Note: English characters are also available with both the International an Cyrillic character sets.

A person with normal vision can easily read the display from a distance of up to 25 feet.

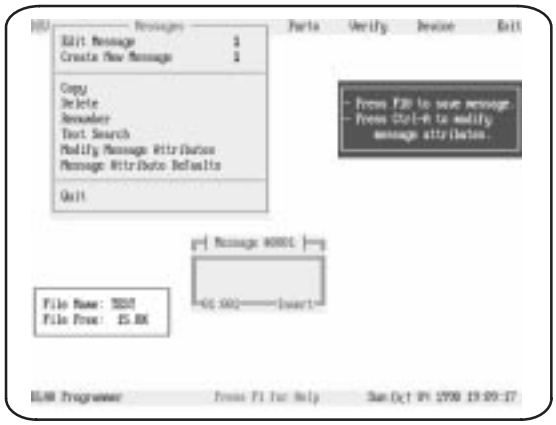
Programming Features

The DL40 Plus is a versatile status, prompt and diagnostic display tool, equipped with a full range of high-end programming and performance features.

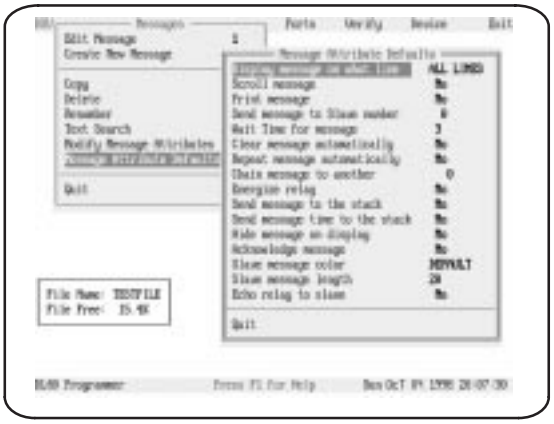
DL40 Plus Capabilities	Remote I/O Version	Parallel Port Version
Supports offline programming software	**Yes**	**Yes**
PLC-5 Remote I/O PassThrough via DH+	**Yes**	**No**
PLC-5E Remote I/O PassThrough via Ethernet	**Yes**	**No**
International and Cyrillic character sets	**Yes**	**Yes**
Onboard editing with PC keyboard	**Yes**	**Yes**
Send ASCII data to a PLC via a Remote I/O link	**Yes**	**No**
Send ASCII data to a device via an RS-485 link	**Yes**	**Yes**
Communicates with any programmable controller	**No**	**Yes**
Customizable historical events stack	**Yes**	**Yes**
Real-time clock operations	**Yes**	**Yes**
RS-232 and RS-485 ports	**Yes**	**Yes**
Debug Mode	**No**	**Yes**
Support for auxiliary devices such as slave displays and printers	**Yes**	**Yes**
Background messages	**Yes**	**Yes**
Hidden messages	**Yes**	**Yes**
Embedded variables	**Yes**	**Yes**
Data mode selection	**Yes**	**Yes**
Message chaining	**Yes**	**Yes**
Adjustable parameters for serial communications	**Yes**	**Yes**
Adjustable display brightness	**Yes**	**Yes**

Offline Programming Software

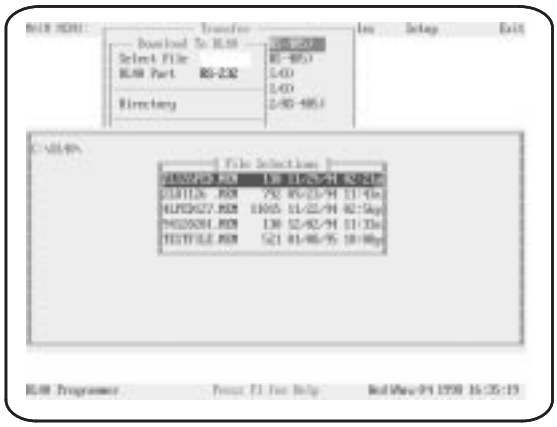
Create and edit application files using the Offline Programming Software (Catalog No. 2706-LSW) on a personal computer. With interactive menus you can quickly create messages, set message attributes, and download messages to one or more DL40 Plus displays.



Create Message editing screen



Set Message Attributes window



Download Message Files screen

Convert DL20 files for use with a DL40 Plus

The offline programming cable (Catalog No. 2706-NC13) provides a direct connection between a personal computer running the Offline Programming Software and a DL40 Plus. This 3-meter cable has a 9-pin, D-shell connector on each end.

International and Cyrillic Character Sets

The local language character sets let you create and display messages in other languages such as French, German, Italian, and Spanish with the Offline Programming Software with:

- English (default)
- International character set ISO 8859–1
- Cyrillic (Russian)

English characters are also available with both the International and Cyrillic character sets.

Onboard Editor

With the Onboard Editor you can create or edit messages, select message attributes, and set options and variable formats using a standard IBM PC keyboard. The Keyboard port is located on the rear panel of the DL40 Plus.

Send ASCII Data to a PLC via Remote I/O Link

Using Remote I/O communications, you can send ASCII data to a PLC. Attach an IBM compatible keyboard to the DL40 Plus and you can enter part numbers, badge numbers, passwords, and similar information as required. The DL40 Plus processes and displays the information, and then sends it to the controller.

You can establish similar communications over an RS-232 or RS-485 link.

Communicate with any Programmable Controller (Parallel Port Version)

The DL40 Plus accepts information from any programmable controller over a total of 20 input lines (16 data and 4 strobe lines).

Parallel Port versions of the DL40 Plus have an isolated 12 VDC supply output that can be used to power outputs that pull data and strobe lines high.

Backup Operations

Archive DL40 Plus application files in the Offline Programming Software (Catalog No. 2706-LSW) by uploading or downloading files between a computer and DL40 Plus displays.

Historical Events Stack

The Historical Events Stack records the occurrence and sequence of some or all messages and logs variable data values that have been triggered and/or displayed. The 16K bytes of stack memory holds about 1,000 events. You can view information in chronological order or by frequency of occurrence, or print the record.

Clock Operations

A real-time battery-backed clock keeps accurate time even when power is removed from the unit. The DL40 Plus can display the current time and/or date in either AM/PM or 24-hour military format.

Note: The date function is year 2000 compliant.

Date and time information can be displayed as part of any triggered message, and passed on to a PLC. You can also date- or time-stamp events as they are recorded in the Historical Events Stack.

Set the DL40 Plus internal clock using the front panel menus, a keyboard connected to the Onboard Editor, a PLC/SLC, or the Offline Programming Software.

RS-232 and RS-485 Ports

The DL40 Plus has both an RS-232 and RS-485 port.

Use the RS-232 port to:

- upload or download message files from a computer
- trigger messages via Open protocol (ASCII triggering)
- send messages to a single slave message display
- print messages and/or the contents of the Historical Event Stack

Use the RS-485 port to:

- multi-drop upload or download message files from a computer
- trigger messages via Open protocol (ASCII triggering)
- send messages to one or more slave message displays
- input ASCII data via bar code

Keyboard Port

Use the Keyboard port on the DL40 Plus to:

- edit options, messages, communication port settings
- input ASCII data to a host controller, PLC, or computer
- trigger messages using Open protocol (ASCII triggering)

Debug Mode (Parallel Port Version)

Use Debug mode to display the binary status (1 or 0 value) of the data lines and the state of the strobe lines. This mode is useful for checking the output of a programmable controller.

Auxiliary Devices

Connect a variety of useful auxiliary devices to the DL40 Plus display.

Slave Displays
Address up to 126 DL40 Plus or DL50 slave displays over an RS-485 network at distances up to 4,000 feet (1200 m) from the originating DL40 Plus. You can also control the annunciation relay on remote DL40 Plus or DL50 Series slave displays. By assigning a specific address to each slave display, you can control which slaves receive and display a given message.

Printers
Connect a serial printer to print the Historical Events Stack or a listing of the internal application file. The time and date a message was triggered can be included on the stack printout. You can also set message attributes such as sending triggered messages to a printer through the RS-232 port.

Alarms
The alarm relay activates or deactivates an external remote alarm or warning light. Individual message attributes can be set to energize or de-energize the alarm relay contacts on DL40 Plus or slave displays.

ATTENTION: Use the DL40 Plus alarm relay for annunciation purposes only. Do **not** use the alarm relay for control applications.

Background Messages

Specify a background message that will display whenever the DL40 Plus has no other triggered messages in the queue.

Hidden Messages

Hidden messages do not appear on the DL40 Plus display or have any affect on what is being displayed. Hidden messages can be sent to a slave display, printed, or stored on the Historical Events Stack.

Embedded Variables

Messages can contain variable data. Variable values are received when the message is triggered. Incoming variable data can be binary, BCD (binary coded decimal), and/or ASCII. You can also embed time and date information in a message from the battery-backed real-time clock of the DL40 Plus.

Data Mode Selection

When using the DL40 Plus with Remote I/O or parallel input for communication, you can select two data modes:

- Binary
- Binary Coded Decimal (BCD) either signed or unsigned

Within any application, triggers and variable data can be in either form. For example, message triggers can be in a binary format, while variable data can be BCD.

Note: When using serial RS-232 or RS-485 communications, all data is in ASCII character format.

Message Chaining

Chain messages together for display in sequence. Only the first message in the chain is triggered from the host controller. Then each message in the chain can trigger the next until the complete sequence has run.

Adjustable Parameters for Serial Communications

With the DL40 Plus, you can configure RS-232 or RS-485 port parameters as needed for compatibility with PLCs/SLCs, printers, slave displays, or control computers.

Serial Communication Parameters	Settings
Baud Rate	300, 1200, 2400, 4800, 9600, 19200
Parity	Odd, Even, No Parity
Handshake	Software, Hardware, None
Data Bits per Character	7 or 8
Null Count	0 to 255 Allows you send a string of nulls to the printer between characters. Useful with slow printers that drop characters because they can't keep up with normal DL40 Plus output.
Page With	20 –132 characters Useful for narrow width printer devices.

Operating Modes

The DL40 Plus has a number of operating modes. Each mode provides tools to perform a different set of functions. The following sections provide a brief overview of the operating modes.

Run Mode

Run mode is the normal operating mode for the DL40 Plus. In Run mode, messages are triggered for display on the DL40 Plus and slave message displays (if desired).

The Remote I/O version of the DL40 Plus comes up in Run mode after a reset. The Parallel port version also comes up in Run mode, except when the Run Mode/Debug DIP switch is set to Debug on the DL40 Plus.

The Remote I/O version of the DL40 Plus has 4 Run modes.

- **Message/Variable/Slave Mode** triggers a message with variables containing up to 20 ASCII or 40 BCD characters in any combination as long as the total does not exceed 10 words. This mode allows you to override the slave address attribute.
- **Message/Variable Mode** is similar to the Message/Variable/Slave mode but you cannot override the slave address attribute.
- **Message List Mode** triggers a message list of up to 20 messages in round robin order.
- **Bit Trigger Mode** triggers a priority message and up to 496 messages in priority and/or round robin order.

The Parallel port version of the DL40 Plus has 2 Run modes.

- **Message/Variable/Slave Mode** triggers a message with variables containing up to 20 ASCII or 40 BCD characters in any combination as long as the total does not exceed 10 words.
- **Message List Mode** triggers a message list of up to 20 messages in round robin order.

To select Run mode, use the Onboard Editor or the Offline Programming Software.

Serial Triggering (RS–232/RS–485)

Both the Remote I/O and the Parallel port versions of the DL40 Plus support serial triggering. The RS-232, RS-485, or Keyboard port can control message triggering and variable data communications.

Serial triggering uses Open protocol, which communicates using ASCII characters in a serial data stream.

Open protocol is available in the following run modes:

- Message/variable/slave mode
- Message/variable
- Message list

Offline Modes

The DL40 Plus offers the following offline operating modes:

- Help mode
- Historical Recall mode
- Remote Program mode (for Offline Programming Software)
- RS-232/RS-485 Port Configuration mode
- Clock mode
- Print mode
- Debug mode (on Parallel port versions only)

Special Messages

Special messages let you monitor and control certain functions of the DL40 Plus without leaving Run Mode. Special messages normally occupy message numbers 901 through 916. You can move special messages to message numbers 1 to 16, or disable them with the Offline Programming Software or Onboard Editor.

Message Number	Content	Message Number	Content
901 (or 01)	Terminate Message – Clear Display	909 (or 09)	Clear Historical Events Stack
902 (or 02)	Clear Queue	910 (or 10)	Set Interactive Clock
903 (or 03)	Terminate Message – Clear Display and Queue	911 (or 11)	Set Clock with Variable Data
904 (or 04)	Reset Unit	912 (or 12)	Send Time to PLC①
905 (or 05)	Test Display	913 (or 13)	Send Date to PLC①
906 (or 06)	Print Historical Events Stack – Chronological Order	914 (or 14)	View Display Parameters
907 (or 07)	Print Historical Events Stack – Frequency of Occurrence	915 (or 15)	Stop Special Messages/Resume Run Mode
908 (or 08)	View Historical Events Stack	916 (or 16)	Set Display Intensity

① Remote I/O versions only

Controller Support for Remote I/O

The following PLCs and SLCs support Remote I/O communications with the DL40 Plus.

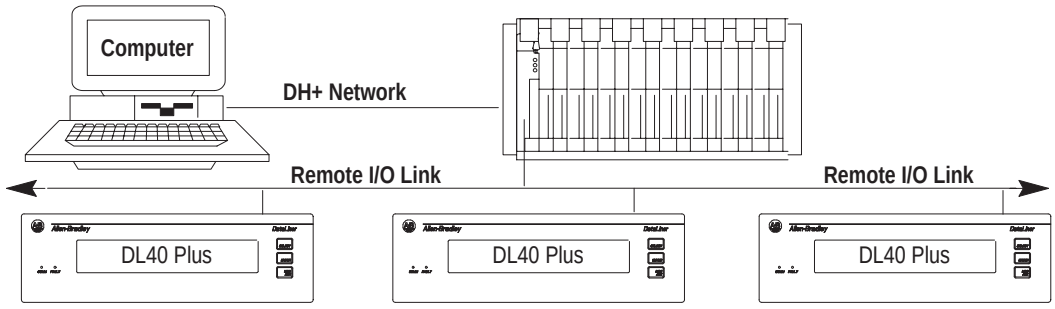
- PLC-5/11, 5/15①, 5/20, 5/25, 5/30, 5/40, 5/60, 5/80, 5/250
- PLC-2, PLC-5/10, 5/12 with Catalog Number 1771-SN Scanner
- SLC-5/02, 5/03, 5/04 with Catalog Number 1747-SN Scanner②

① If you are using a PLC-5/15 with partial rack addressing and block transfers, you must use Series B, Rev. J or later.

② Block Transfer requires a Series B or later Scanner.

PassThrough Support over a DH+ Link

PLC-5 Remote I/O PassThrough lets you upload and download message files between a computer and a DL40 Plus connected by Remote I/O to a PLC on the DH+ link. Refer to Appendix D for an example application. Separate wiring from the computer to the DL40 Plus is not required. For a list of supported controllers, see table below. Refer to Appendix D for additional instructions.



PLCs supporting PassThrough over a DH+ link

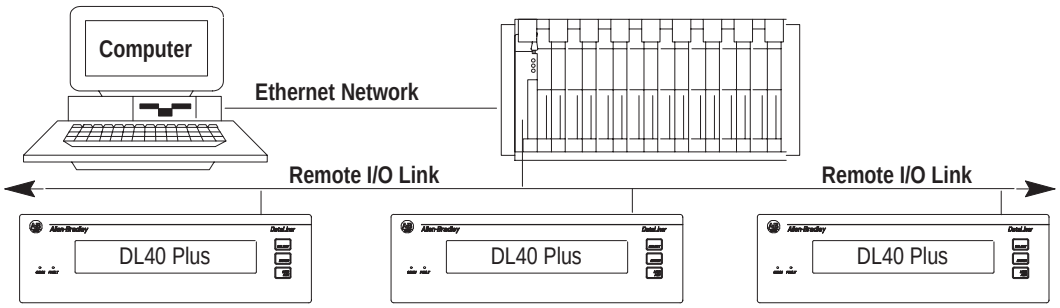
PLC Types	Series	Revision
PLC-5/11	All	All
PLC-5/15	B	N or later
PLC 5/20	All	All
PLC 5/25	A	J or later
PLC 5/30	A	B or later
PLC 5/40	A B	E or later
PLC 5/60	A B	B or later
PLC 5/80	All	All
PLC 5/250	All	All

Computer interface boards for PassThrough

Catalog No.	Description
1784-KT	1/2-slot interface board
1784-KTX	1/2-slot interface board
1784-KL	Interface board for Allen-Bradley 1784-T45 or -T47
1784-KT2	Interface module for IBM PS2
1770-KF2	Serial to DH+ interface module
1784-PCMK	PCMCIA interface board

PassThrough Support over an Ethernet Link

PLC-5E Remote I/O PassThrough lets you upload and download message files between a computer and a DL40 Plus connected by Remote I/O to a PLC on the Ethernet link. Refer to Appendix E for an application example. Separate wiring from the computer to the DL40 Plus is not required. For a list of supported controllers, see table below.



The following table lists the Allen-Bradley PLCs that support PassThrough file transfers with the DL40 Plus message display over an Ethernet link as of this printing.

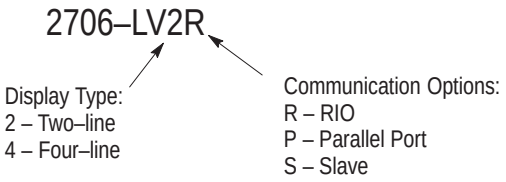
PLC Types	Series	Revision
PLC 5/40E	A B	E or later
PLC 5/60E	A B	B or later
PLC 5/80E	All	All
PLC 5/250	All	All

Use one of the Allen-Bradley Ethernet computer interface boards (or its equivalent) for PassThrough file transfers.

- Catalog Number 6628-A5: Ethernet adapter module for IBM PC compatible computers
- Catalog Number 6628-A7: Ethernet adapter module for IBM MicroChannel bus compatible computers

Available Catalog Numbers

DL40 Plus displays are available with 128K bytes of memory in either 2- or 4-line versions with two communication options.



The table below shows the standard catalog numbers for the DL40 Plus and how they equate to previous versions of the DL40 displays.

DL40 Plus Catalog Number	Description	Equivalent Catalog Numbers for Previous Versions of the DL40
2706–LV2P	Two–line display, AC supply with parallel port	2706–E23J16, 2706–E23C16 2706–E23J32, 2706–E23C32
2706–LV4P	Four–line display, AC supply with parallel port	2706–E43J32, 2706–E43C32 2706–E43J64, 2706–E43C64 2706–E43J128, 2706–E43C128
2706–LV2R	Two–line display, AC supply with remote I/O	2706–E23J16B1, E23C16B1 2706–E23J32B1, 2706–E23C32B1
2706–LV4R	Four–line display, AC supply with remote I/O	2706–E43J32B1, 2706–E43C32B1 2706–E43J64B1, 2706–E43C64B1 2706–E43J128B1, 2706–E43C128B1

Installing the Software

Chapter Objectives

This chapter describes how to install the DL40 Offline Programming Software on your computer. It also explains the basic steps required to configure your system for use with PassThrough on systems equipped with an Allen-Bradley PLC capable of Remote I/O PassThrough file transfers.

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Personal Computer Requirements

The minimum equipment required to install and run the Offline Programming Software consists of an IBM compatible personal computer (PC) with:

- a 386 (or higher) processor
- 640K RAM
- one $3^1/_2$ inch micro diskette drive
- a hard disk with at least 1 Megabyte of available space
- one open serial port (COM1 or COM2)
- one open printer port (LPT1, LPT2, LPT3, LPT4, COM1, or COM2) for printing messages
- a printer

Package Contents

In addition to this manual, the Offline Programming Software package consists of three disks and a number of documents. They include:

- DL40 Plus Offline Programmer
- DL40 Plus PASSTHROUGH Drivers
- DL40 Plus INTERCHANGE Software

Installed Files

After installing the software, your computer will contain a DL40.EXE as well as a PS.HLP file containing online help. If you install the PassThrough capability, you will also have the PassThrough files and their companion TSR (Terminate and Stay Resident) server files.

Memory Requirements

Important: For the Offline Programming Software to operate without generating warning messages about memory limitations, your computer needs a minimum available memory of 570K RAM. Editing a 128K message file requires the full 570K. Smaller message files require less computer memory.

With DOS versions prior to 5.0, use the CHKDSK↵ command at the DOS prompt to determine the available conventional RAM on your system. The available conventional RAM will be reported in bytes. Your system must have 583,680 or more free bytes RAM to run the Offline Programming Software and edit large application files.

With DOS versions 5.0 or higher, use CHKDSK ↵ or the MEM↵ command to accomplish the same task. (The MEM ↵ commands reports more quickly and in greater detail than does CHKDSK ↵ .) The value reported for free conventional memory must be at least 570K.

The following table provides RAM recommendations for creating and editing message files and requirements for using PassThrough. If your computer has less than the required bytes free, reduce the number of memory resident programs (communications programs, mouse drivers, etc.) your computer is running. For additional information on increasing the amount of available memory, refer to the configuration section of your computer's DOS manual.

PC memory requirements for typical activities

Function	For a	CHKDSK bytes free
Create and edit message files	DL40 Plus, 128Kbyte message memory	580,000 bytes (recommended)
PLC–5 PassThrough w/DH+	PLC–5 with a DH+ Communications Interface Card	515,000 bytes (required)
PLC–5 PassThrough w/Ethernet	PLC–5 with an Ethernet Communications Interface Card & FTP's PC/TCP Software	515,000 bytes (required)

Memory Management

Your computer system configuration at startup can affect the amount of RAM available for use by the Offline Programming Software. DOS offers a number of options that can help increase the amount of RAM available to programs.

With DOS versions 5.0 or earlier you can maximize available RAM by editing your CONFIG.SYS file. Your CONFIG.SYS should contain text lines similar the following:

```
DOS=HIGH, UMB
DEVICE=C:\DOS\HIMEM.SYS
BUFFERS=10
FILES=10
STACKS=9,128
```

In the example above, the BUFFERS, FILES, and STACKS values are set to low values to conserve RAM for program operation.

Important: The line `DOS=HIGH,UMB` should be used only with DOS versions 5.0 or higher.

DOS version 6.0 introduced the MEMMAKER command, which automates memory management and can often free large amounts of RAM. DOS 6.0 and higher versions also allow you to create multiple configuration files from which to choose at startup. This feature can prove useful on PCs used for programming the DL40 as well as other activities.

Refer to your DOS user manuals for information on creating and editing CONFIG.SYS files, techniques for optimizing memory, and using multiple configuration files on a single PC.

Installation

The Offline Programming Software can be installed and run in any of three distinct environments:

- without PassThrough file transfers
- with PassThrough file transfers over a DH+ link
- with PassThrough file transfers over an Ethernet link

Installation of the basic Offline Programming Software is the same for all three environments. You will have to perform additional steps to install PassThrough capability on either a DH+ or Ethernet link.

Basic Installation (without PassThrough)

Use the following procedure to install the basic Offline Programming Software files on an IBM PC. Note that prompts appearing here represent a typical PC. The prompts you see on your computer may vary slightly from those shown here.

Note: Do not automatically install all of the program disks. First determine the type of installation you require and install just the programs required.

1. If running in a Windows environment, restart your computer in DOS mode. Windows NT users need to restart their computers with a Windows 95 or less operating system.
2. Start your computer and log on to the hard disk (normally you will see the DOS prompt C:>).

   Note: Depending on your installation, your DOS prompt may be different.
3. Insert the DL40 Offline Programmer disk into the micro drive. Most often this will be the A: drive.
4. At the DOS prompt (C:>), type:

   ```
   A:INSTALL↵
   ```
5. Follow the onscreen installation prompts until installation is complete and the C:> prompt reappears. **Note:** If the Offline Programming Software program is already on disk, you will be able to overwrite the program during installation.
6. The installation procedure automatically creates a default sub–directory which contains the Offline Programming Software program. By default that directory is DL40. Change to that directory by typing:

   ```
   CD\DL40↵
   ```

Software Installation for DH+ PLC PassThrough

If you are using a DH+ link and want to enable PLC PassThrough file transfers, you must perform the following additional steps after completing the basic installation described above.

The following paragraphs outline only the most essential information required to install and use PassThrough file transfers on a DH+ link. Refer to the instructions that came with your DH+ add-in board.

Install and Configure Your DH+ Communication Interface Card

Install and configure your DH+ communication interface card. Refer to the instructions that came with the card for information on how to install and configure it. Currently the following DH+ cards are supported by the Offline Programming Software:

- 1784-PCMK
- 1770-KF2
- 1784-KT2
- 1784-KL
- 1784-KT
- 1784-KTX

Important: Be sure to record the IRQ and Card address for each interface card. You will need to know them later in the configuration process.

Install the Offline Programming Software

Perform the basic installation procedure described earlier in this chapter to install the Offline Programming Software on your personal computer.

Install and Configure INTERCHANGE

Your Offline Programming Software package contains a runtime version of Allen-Bradley's INTERCHANGE software and a number of other files. You must install this package to perform PassThroughs over a DH+ network device.

INTERCHANGE software is an Application-Programming Interface (API) that provides a host computer running the MS-DOS operating system with a library of executable commands. INTERCHANGE software lets multiple applications share a single common interface module to communicate with various devices on DH+ and/or DH-485 networks. Use the following procedure for installation:

1. Insert the INTERCHANGE disk into your $3^1/_2$ inch drive.
2. Start the automated installation procedure by typing:

   ```
   A:INSTALL↵
   ```

   This program copies all required INTERCHANGE files to the directory \ABIC\BIN on your hard disk. Those files include the executable INTERCHANGE servers listed below:

   - DTL_KT.EXE
   - DTL_DF1.EXE
   - CFG_KT.EXE
   - CFG_DF1.EXE
   - RNASTR.EXE
   - RNA.EXE

   Important The next part of the installation and configuration process depends on how you use your PC. If you use your PC for other activities in addition to offline programming, then you should create a new batch file as described in step 3. If you use your computer solely for the Offline Programming Software, then modify your AUTOEXEC.BAT file as described in step 4 below.

3. If you use your PC for other activities in addition to offline programming, then create a new batch file containing the INTERCHANGE server files listed above. You can name the file anything you want, but it must end with the extension .BAT. Assume you call the file ABICRUN.BAT, and your hard drive is drive C:

   a. Create the file with any ASCII text editor. If you use the DOS text editor, type:

   ```
   EDIT C:\ABICRUN.BAT↵
   ```

   b. Type in the names of the INTERCHANGE server files. Put each file name on its own line followed by a hard return:

   ```
   DTL_KT.EXE
   DTL_DF1.EXE
   CFG_KT.EXE
   CFG_DF1.EXE
   RNASTR.EXE
   RNA.EXE
   ```

c. Save the file. If you are using the DOS text editor, type:

```
[ALT]FXY
```

d. Skip step 4 and go on to step 5.

4. If you use your PC solely for the Offline Programming Software, you need not create a new batch file. Instead, you should modify your AUTOEXEC.BAT file to load the INTERCHANGE server files whenever you start your system.

a. Open the AUTOEXEC.BAT file with any ASCII text editor. If you use the DOS text editor, type:

```
EDIT C:\AUTOEXEC.BAT↵
```

Your AUTOEXEC.BAT file contents will appear in the editing window.

b. Move the cursor to the end of the file.

c. Type in the names of the INTERCHANGE server files. Put each file name on its own line followed by a hard return:

```
DTL_KT.EXE
DTL_DF1.EXE
CFG_KT.EXE
CFG_DF1.EXE
RNASTR.EXE
RNA.EXE
```

Do not close the file at this time.

5. If your AUTOEXEC.BAT is not open in your ASCII text editor, then open it now. If you use the DOS text editor, type:

```
EDIT C:\AUTOEXEC.BAT↵
```

Your AUTOEXEC.BAT file contents will appear in the editing window.

6. Locate the line in your AUTOEXEC.BAT file that begins with the word PATH. This is your system's "Path Statement", which tells DOS where to look for executable files when no specific path is otherwise specified.

7. Move to the end of the Path line and insert the complete name for the directory in which the INTERCHANGE server files were stored. In a standard installation they are located in C:\ABIC\BIN. When you have finished editing it, your Path Statement will look like this:

```
PATH=C:\DOS;C:\APP1;C\APP2;C:\ABIC\BIN
```

Create CFG_KT.INI File

INTERCHANGE needs to know exactly what hardware you are using, and how it is configured. This information is provided by a configuration file (CFG_KT.INI) modified to match your own installation.

1. Edit the file with any ASCII text editor. If you use the DOS text editor, type:

```
EDIT C:\ABIC\BIN\CFG_KT.INI↵
```

The CFG.INI file that installs with INTERCHANGE includes configurations for numerous cards. Lines preceded by a semicolon (;) have been commented out. To activate your interface card, edit and uncomment the appropriate options by removing the semicolon at the beginning of the line.

If you are using a card other than the 1770-KF2 go to step 2 below. If you are using the 1770-KF2 communications interface card, skip step 2 and go directly to step 3.

2. If you are using a card other tha*n* the 1770-KF2, the contents of the CFG_KT.INI file should be similar to the format shown in the sample file below. This sample is for a 1784-KT board:

```
[DTL_KT.Options]          ①
PATH=C:\ABIC\BIN          ②
                          ③
[DTL_KT.1]                ④
DEVICE=KT                 ⑤
MEMORY=C800               ⑥
PROTOCOL=DHPLUS           ⑦
IRQ=5                     ⑧
STATION=77                ⑨
NAME=DTL_KT 1             ⑩
```

In this file:

① This line identifies the file and prefaces a section of the file used to record information common to all the communications interface cards on your system.

② PATH line that designates the directory where the INTERCHANGE server programs are located. This will be the same value for all interface cards on your system.

③ Blank line to separate sections and improve readability.

④ This line identifies the general class of hardware device (in this case a KT device) and a logical pushwheel identifier of 1. **Note:** The DL40 Offline Programming Software assumes that pushwheel 1 is used. Only use pushwheel 1 when communicating with the DL40 Offline Programming Software.

⑤ DEVICE line that specifies the exact communication interface card used. Acceptable values include KT, KTX, KL, KT2, or PCMK.

⑥ MEMORY line that matches the dip switch settings on the interface card.

⑦ PROTOCOL line that identifies the protocol in use.

⑧ IRQ line that matches the dip switch settings on the interface card.

⑨ STATION line designates the octal station address on the communications link.

⑩ NAME is a unique string you define to specify to this configuration.

Models for other interface cards appear below. Note that some of the values in these files vary depending on the installation.

1784-KT2

```
[DTL_KT.Options]
PATH=C:\ABIC\BIN

[DTL_KT.1]
DEVICE=KT2
MEMORY=C400
PROTOCOL=DHPLUS
IRQ=5
STATION=77
NAME=DTL_KT2
```

1784-KL

```
[DTL_KT.Options]
PATH=C:\ABIC\BIN

[DTL_KT.1]
DEVICE=KL
MEMORY=E000
PROTOCOL=DHPLUS
IRQ=2
STATION=77
NAME=DTL_KL 1
```

1784-KTX

```
[DTL_KT.Options]
PATH=C:\ABIC\BIN

[DTL_KT.1]
DEVICE=KTX
MEMORY=D400
PROTOCOL=DHPLUS
IRQ=10
STATION=77
NAME=DTL_KTX1
```

1784-PCMK

```
[DTL_KT.Options]
PATH=C:\ABIC\BIN

[DTL_KT.1]
DEVICE=PCMK
MEMORY=CF00
PROTOCOL=DHPLUS
IRQ=7
STATION=77
NAME=DTL_PCMK
```

3. If you are using the 1770-KF2 communications interface card, the contents of the CFG_KT.INI file should be similar to the format:

```
[DTL_KT.Options]
PATH=C:\ABIC\BIN

[DTL_DF1.1]
DEVICE=DF1
BAUD=9600
IRQ=4
COM_PORT=2
NAME=DTL_DF1
ERROR=1 ①
PARITY=0 ②
DUPLEX=1 ③
```

① 0=BCC,1=CRC
② 0=No Parity, 1=Even Parity
③ 0=Half Duplex, 1=Full Duplex

4. Save the file. If you are using the DOS text editor, type:

```
[ALT]FXY
```

Installing the Software for Ethernet PLC PassThrough

If you are using an Ethernet link and want to enable PLC PassThrough file transfers, you must first modify your CONFIG.SYS and AUTOEXEC.BAT files, and install and configure the following products on your computer:

- Allen-Bradley Ethernet communications interface card (Cat. Nos. 6628-A5 or -A7) or equivalent
- FTP's PC/TCP Software for DOS/Windows (FTP Cat. No. PC-210)

Install Ethernet Card

Follow the instructions that came with your Allen-Bradley Ethernet communications interface card to install and configure it on your personal computer.

Install the PC/TCP Software

Follow the instructions that came with FTP's PC/TCP Software to install it on your personal computer.

Install the Offline Programming Software

Perform the basic installation procedure described earlier in this chapter to install the Offline Programming Software on your personal computer.

Modify CONFIG.SYS & AUTOEXEC.BAT Files

The following steps show a sample network setup. Consult with your network administrator to determine if this setup applies in your environment.

1. Change to the directory containing the PC/TCP drivers. Type:

   ```
   CD \PCTCP↵
   ```

2. At the C:\PCTCP> prompt, type:

   ```
   RENAME FTP22DOS.INI PROTOCOL.INI
   ```

3. Open the CONFIG.SYS file with any ASCII text editor. If you use the DOS text editor, type:

   ```
   EDIT C:\CONFIG.SYS↵
   ```

   Your CONFIG.SYS file contents will appear in the editing window.

4. Move the cursor to the end of the file.

5. Assuming you have installed the Ethernet Board drivers in the directory C:\PCTCP (the default), be sure the following lines appear in your CONFIG.SYS file.

```
DEVICE=C:\PCTCP\PROTMAN.DOS /I:C:\PCTCP
DEVICE=C:\PCTCP\SMC8000.DOS
DEVICE=C:\PCTCP\DIS_PKT.GUP
```

6. Save the file. If you are using the DOS text editor, type:

```
[ALT]FXY
```

7. Open the AUTOEXEC.BAT file with any ASCII text editor. If you use the DOS text editor, type:

```
EDIT C:\AUTOEXEC.BAT↵
```

   Your AUTOEXEC.BAT file contents appears in the editing window.

8. Move the cursor to the end of the file.

9. The following lines should appear in the AUTOEXEC.BAT file. If they are not there, add them now.

```
SET PCTCP=C:\PCTCP\PCTCP.INI
C:\PCTCP\NETBIND.COM
C:\PCTCP\ETHDRV.EXE
```

For additional information regarding installation of your PC/TCP software, refer to the section on installing an NDIS driver in the PC/TCP Software Installation Guide.

Restart Your PC

When installation is complete, remove the installation diskette from the $3^1/_2$ inch micro drive and store all installation software in a safe place. Finally, restart your PC to activate your changes to the CONFIG.SYS and AUTOEXEC.BAT files.

Configure Your PLC

Use Allen-Bradley's 6200 Series PLC-5 programming software or the EIBOOT utility to set the PLC's IP address. Refer to the documentation that came with your PLC for additional configuration information.

Starting the Program

If you have installed the Offline Programming Software without PassThrough processing, your computer will return to the DOS prompt, C:\DL40>. If you have installed PassThrough processing, your computer returns to the directory it displayed when you began the PassThrough processing installation.

If you do not return to the C:\DL40> directory, change directories by typing:

```
CD C:\DL40↵
```

You may then start the the Offline Programming Software program by typing:

```
DL40↵
```

Establishing Initial Non–networked Communications

The communication port settings on your computer and the DL40 must be the same in order to communicate.

- the port usage on the RS-485 port must be set to PRGMR to perform message file transfers via the RS-485 port.
- the DL40 RS-232 port will always communicate with the DL40 Offline Programming Software regardless of the port configuration.
- set your computer's serial communication port to the following:
  - baud rate 9600
  - data bits 8
  - parity none
  - handshaking none
- Use the [SELECT] and [ENTER] push buttons on the front panel of the DL40 to select SET RS232PORT?– PGMR/PRNTER SETUP or SET RS-485 PORT?–PRGMR and set the parameters to match the setting of your computer's serial communication port.

  Note: Select Enable DIP switch (SW2-9) must be ON.
- You can also change the settings of the DL40's serial ports with the [CTRL][R] command using the DL40's Onboard Editor and an IBM compatible keyboard connected to the rear keyboard port of the DL40 display.

Navigating the Software

Chapter Objectives

This chapter provides a basic understanding of how to move around in the DL40 Offline Programming Software. The information in this chapter will help you:

- start the program
- move around within the program
- exit the program

This chapter contains the following topics:

Topic	Page
Starting the Software	3–1
Title Screen and Main Menu	3–2
Getting Help	3–3
Setup Menu	3–4
Menu Control Keys	3–6
Shortcut Keys	3–6
Exiting the Software	3–7

Starting the Software

After you have installed and set up the Offline Programming Software on your computer, you can run the program at any time. The most basic way to do so is to:

1. Start your computer.
2. Make sure you are logged on to the C: drive by typing:

   `C:↵`
3. Go to the directory C:\DL40 by typing:

   `CD C:\DL40↵`
4. Start the program by typing:

   `DL40↵`

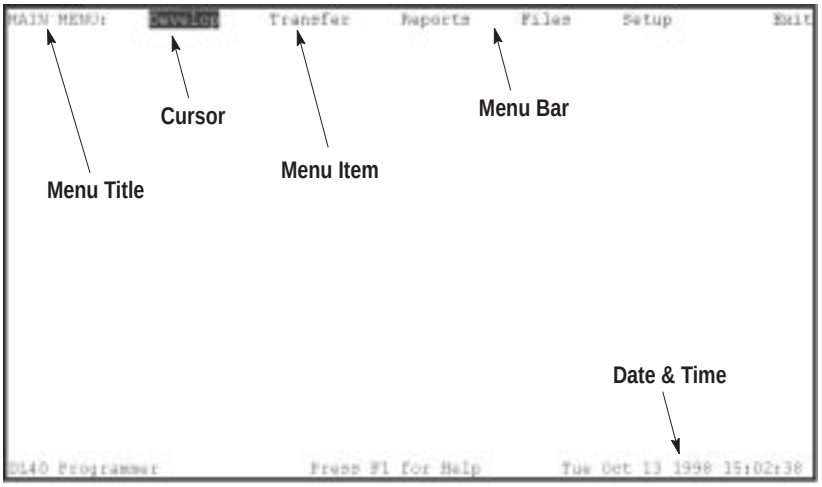
Title Screen & Main Menu Bar

The program opens with the Title screen shown below. The screen identifies the product, and indicates the revision number and date of the software. Close this screen and open the Main Menu screen by pressing any key.

Opening title screen

Dataliner Development Software
Bulletin 2706 DL40 Plus Dataliner Message Displays
Revision 1.0 9/1/98
Catalog #2706-LSW
Copyright 1998 Allen-Bradley Company, Inc
All Rights Reserved
Press any key to continue

Main Menu screen



Getting Help

The Offline Programming Software offers context-sensitive online Help at any time. To use Help:

- press [F1] to access a Help screen offering information about the highlighted menu item.
- press [F1] again to replace the current Help screen with the Menu Key Control Help screen.
- press [ESC] to close the Menu Key Control Help screen and return to the context-sensitive Help screen
- press [ESC] to close the context-sensitive Help screen and return to the Main screen

Sample Help Screen

Use the [↑] and [↓] keys to scroll through the help text.

Setup Menu

Use the Setup menu to match the software to your color or monochrome monitor, and to set the date and time. Access the Setup menu by using the right and left arrow keys to move to Setup and pressing [↵], or by pressing [S] at the Main menu.

Setup Menu

Configuring the Program to Match Your Monitor

The Offline Programming Software supports both color and monochrome displays. To change the display type, move the cursor to Setup on the Main menu and press [↵]. Select Colors, and then select either Color or Monochrome. Select Yes to confirm your choice, then press [↵]. A message appears in the center of the screen to indicate that the software is saving your selection to its setup file. Press [Q] or [ESC] repeatedly to return to the Main menu.

Setup→Colors Screen

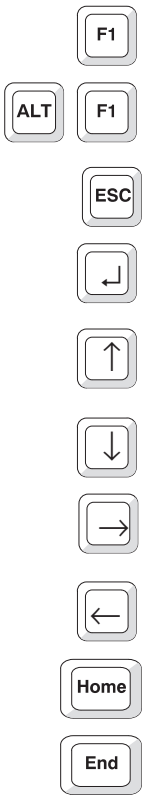
Setting Time & Date

You can set the time and date by selecting Setup→Time & Date or by pressing [S][T] from the the Main menu bar. The Date & Time window appear showing the current date and time setting of the personal computer. The cursor will highlight Time when the window first opens. Press [↵] and input the desired time using military style (24-hour) format. Press [↵] to record your changes and move the cursor to Date. Press [↵] and input the desired date. Press [↵] to record your changes and move the cursor to Quit.

Setup→Time & Date Screen

Menu Control Keys

Use the following keys to navigate through the Offline Programming Software menus. These keys have the same effect wherever they are used in the software. Individual screens may use additional keystroke commands. These additional commands are described immediately below the sample screens that appear throughout this manual.



Help. Pressing F1 when Help is open will open the Menu Key Control help screen

Toggle Help screen between partial and full screen view.

Return to the previous menu.

Select highlighted menu item.

Highlight previous menu item.

Highlight next menu item

Move the cursor to the right

Move the cursor to the left

Highlight first menu item.

Highlight last menu item.

Shortcut Keys

You can also select most menu items by typing their initial letter. For example, to exit the program you can type [E][Y]. [E] is the initial letter in the Exit Main menu item, and [Y] is the initial letter of the Yes Exit menu item.

Exiting the Software

You can exit the Offline Programming Software at any time by repeatedly pressing [ESC] until the Exit Confirmation menu appears. Press [↵] to confirm your intention to exit the program.

Exiting the Offline Programming Software

You can also exit the program by typing the shortcut keys [E][Y] from the Main menu.

Creating Message Files

This chapter describes the functions available to you from the Develop menu. As its name implies, the options available from this menu provide the tools needed to create and manage your application files for the DL40 message display. This chapter contains the following topics:

	Page
Develop Menu	4–2
File Selection Screen	4–4
Create New File Window	4–5
Data Path Directory Window	4–6
Develop Screen	4–7
Messages Menu	4–8
Edit Message Screen	4–9
Message Text Window	4–10
Create New Message Screen	4–16
Copy Messages Screen	4–17
Delete Message Screen	4–19
Renumber Messages Screen	4–20
Text Search Screen	4–22
Modify Message Attributes Screen	4–24
Message Attribute Default Screen	4–32
Options Menu	4–34
Ports Menu	4–36
Verify Menu	4–39
Device Menu	4–44

Develop Menu

To open the Develop menu, use the right and left arrow keys to highlight Develop on the Main menu bar, then press [↵].

Develop Menu

Special keys

You may use the following special keys on the Develop menu.

↓ ↑	Move the cursor to the desired function
Home	Move the cursor directly to the first menu item (Select)
End	Move the cursor directly to the last menu item (Quit)
↵	Selects the item highlighted by the cursor
ESC	Closes the Develop menu and returns cursor to Main menu
F1	Get Online Help

Notes

From the Develop menu you can choose from the following:

- Select File to modify an existing data file.
- Create New File to create a new data file.
- Directory to specify a data path

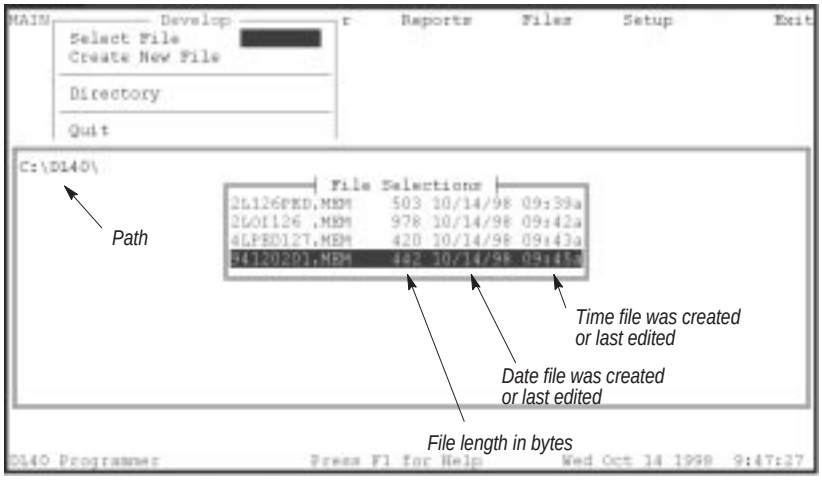
The Offline Programming Software supports both color and monochrome monitors. Make sure your monitor type matches the type selected in the Setup menu. Refer to Chapter 3 for instructions on changing your monitor type.

You cannot Select a file unless that file is located on the current DOS path. If necessary, use the Directory menu item to change directories. The window that opens when you pick Develop→Select File shows the current directory in the upper left.

File Selections Screen

When Select File is selected, a window appears with the default path in the upper left corner and a list of the files found in that path. If you want to edit files under a different path, press [ESC], highlight Directory, and press [↵]. You can then edit the program's data path in the window show below.

File Selections screen showing typical application file list



Special Keys

Use the following special keys on the File Selections screen.

↓ ↑	Move the cursor to the desired file
Home	Move the cursor directly to the first file
End	Move the cursor directly to the last file
↵	Selects the item highlighted by the cursor (Opens Develop Screen)
ESC	Returns to the top level of the Develop menu
F1	Get Online Help

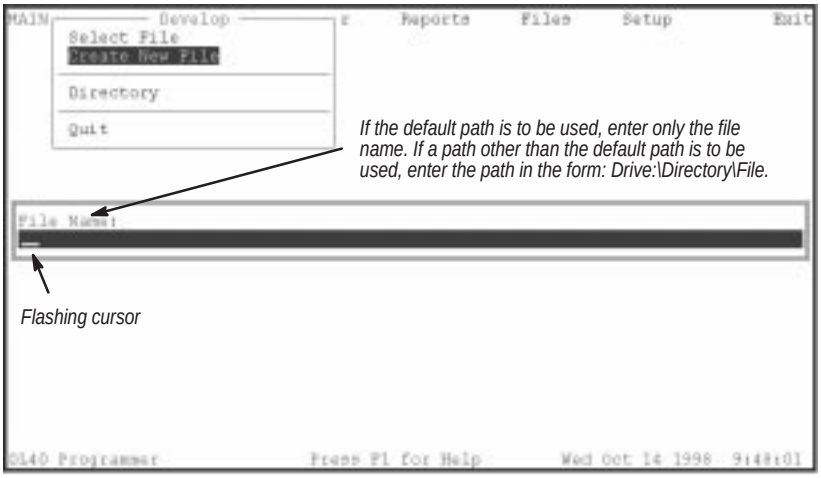
Notes

Use the arrow keys to move to the file you want to edit and press [↵]. If the name of the file you want to edit does not appear here, you may be using the wrong data path. Change the data path by backing up and selecting Directory on the Develop menu.

Create New File Window

When Create New File is selected on the Develop menu, a window opens in which you can enter a new file name. Type in the file name and press [↵]. You can type a drive and directory path as well if you do not want to store the file on the current data path.

Create New File Window



Special keys

You may use the following special keys on this window.

← →	Moves the cursor forward or backward through the file name to allow editing
↵	Accepts the file name (and path, if applicable). Opens Develop Screen
ESC	Returns to the top level of the Develop menu
F1	Get Online Help

Notes

When creating a new file you will be asked to specify a path and filename in the format:

Drive:\Directory\File

If you do not specify a path, then the currently active path will be used.

When you press [↵] to accept the file name in the Create a New File window, the Device menu opens.

Data Path Directory Window

Change data path directories by selecting Develop→Directory from the Main menu bar. When you enter a complete directory path in the Directory window the Offline Programming Software will use that path as a default for all file activities. Override the Directory setting by typing another complete data path when naming files.

Data Path Directory window

Special Keys

Use the following special keys on this window.

← →	Moves the cursor forward or backward through the data path description to allow editing
↵	Accepts the data path directory you have entered in the window
ESC	Returns to the top level of the Develop menu
F1	Get Online Help

Notes

When creating a new data path, specify the path in the format:

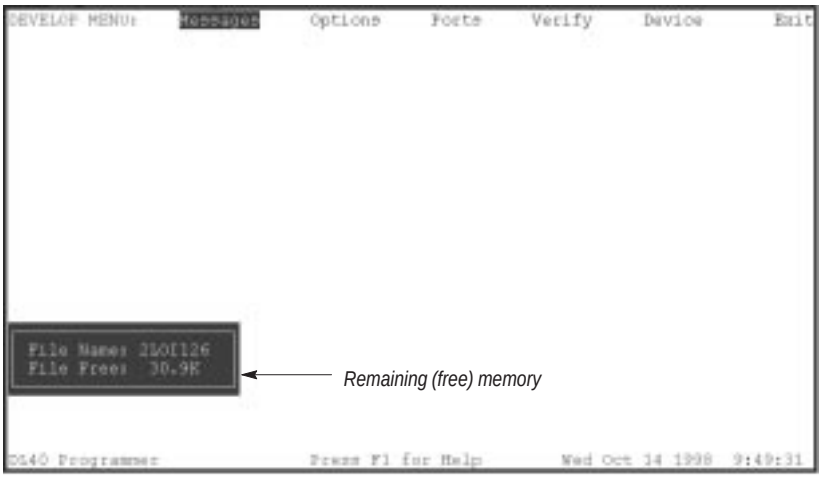
Drive:\Directory1\Directory2\Directory3

You can change the selected data path directory at any time the Message menu is displayed. The change becomes effective immediately.

Develop Screen Menu

Editing an existing file and creating a new file use the same screen. After entering the name and data path of a file to create or change, the screen shown below appears. Notice that the Main Menu bar has been replaced by a the Develop Menu bar. Use this menu bar as you would use the Main menu bar.

Develop Screen menu after selecting or creating a file


DEVELOP MENU: Messages Options Ports Verify Device Exit
File Name: 2LOI126
File Free: 30.9K
Remaining (free) memory
2640 Programmer Press F1 for Help Wed Oct 14 1998 9:49:31

Special Keys

Use the following special keys on this menu.

← →	Moves the cursor to the desired function
M O P V E	Moves the cursor directly to the desired function: Messages, Options, Ports, Verify, or Exit.
Home	Moves cursor directly to the first function (Messages)
End or ESC	Moves cursor directly to the last function (Exit)
↵	Selects the function highlighted by the cursor
F1	Get Online Help

Notes

The Messages, Options, Ports, Verify, and Device branch menus control every aspect of your message file. Work through each of these menus in turn to avoid omissions and mistakes.

Specify a selection for every item on the Develop menu bar branch menus. If you have not edited every selection, a System Attribute Warning message appears when you save the file.

Messages Menu

Use the selections on the Messages menu to create, edit, and control the display format of messages intended for display on the DL40.

Messages menu

Special keys

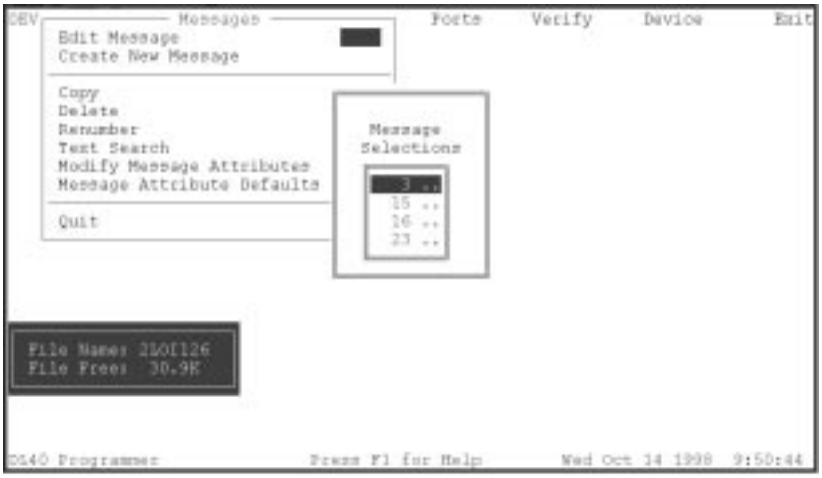
Use the following special keys on this menu.

↓ ↑	Moves the cursor to the desired function
Home	Moves the cursor directly to the first menu item
End	Moves the cursor directly to the last menu item (Quit)
↵	Selects the item highlighted by the cursor
ESC	Closes the Develop menu and returns cursor to Main menu
F1	Get Online Help

Edit Message Screen

After you have selected Edit Message, the Message Selections window shown below opens. Select the message you want to edit, then press [↵] to open the Message Text window

Message Selections after selecting Edit Message



Special keys

You may use the following special keys on this window.

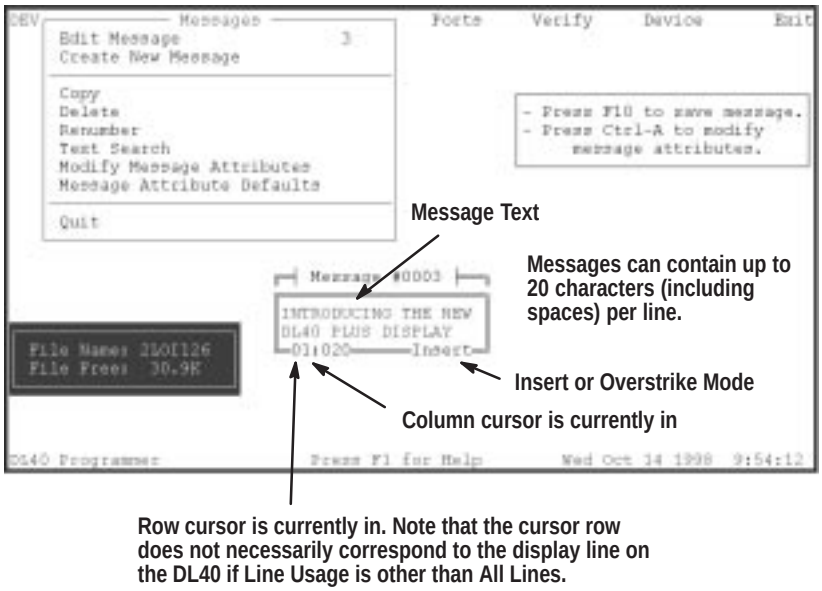
↑ ↓	Moves the cursor to the desired message.
Home	Moves cursor directly to the first message.
End	Moves cursor directly to the last message.
↵	Selects the message highlighted by the cursor and opens the Message text window.
ESC	Closes the window and returns to the Messages menu.
F1	Get Online Help.

Message Text Window

After you have selected a message from the Message Selections window by highlighting it and pressing [↵], a window opens showing the text of the selected message. In this window you can edit the message as required.

Note that the Message Text window also appears when you select Create New Message from the Messages menu as described on page 4–8.

Message Text window



Special Keys and Editing Rules

You may use the following keys to move through and edit your message text.

↑	Moves the cursor up or down one line at a time
← →	Moves the cursor right or left without changing the underlying text
Home or End	Moves cursor directly to the beginning or end of the message
PgUp or PgDn	Moves cursor exactly 1 display window forward or backward through the message (except when Scroll attribute is set as described on page 4–26
Insert	Toggles between insert and overstrike. If there is a character at the position of the cursor, then the insert mode inserts a character immediately to the left of the cursor. In overstrike mode the character at the cursor position is replaced by any new character you type.
Back Space	Deletes the character to the left of the cursor
DEL	Deletes the character at the cursor position
↵	Inserts a return to start a new line
ALT	Press the [ALT] key while entering a number from the numeric keypad inserts an ASCII or Extended ASCII character. See Appendix A.
Any alphabetic or numeric key	Inserts that character at the position of the cursor.
CTRL plus V F W X T or Y	Add or modify variables (see below)
CTRL A	Lets you set Message Attributes for *only* the message being created or edited.
CTRL B	Start and end marker for blinking characters. Must be used in pairs. The text between the markers will blink on the message display.
CTRL E	Erases message text, but leaves message number intact. You will be asked to confirm this action before it takes effect.
CTRL N	Centers or un-centers the active message in the Edit Message window.
ESC	Returns to Messages menu. Note that the Abort Message Edit confirmation window appears if you have changed the message in any way. The window asks if you want to discard your changes.
F1	Get Online Help
F2	Toggles size of Message Text window between 40 and 200 characters
F10	Saves changes and returns to the Messages menu

More About Variables

You can send variables to the DL40 from a PLC or via the Parallel Input Port. Variables can be sent to message only in the Message/Variable/Slave or Message/Variable Run Modes. Insert variables using the [CTRL] key in combination with a letter. Commands to add or modify variables include:

Command	Function
[CTRL][V]	Insert a BCD or binary variable
[CTRL][F]	Change the formatting parameters of a variable
[CTRL]W]	Insert ASCII or BCD variable data
[CTRL][X]	Insert request for ASCII input data
[CTRL][T]	Insert the system time into a message
[CTRL][Y]	Insert the system date into a message

The number of variables you can insert in any one message depends upon your hardware and the selected Run Mode.

Insert Formatted Variable With [CTRL][V]

Use [CTRL][V] to insert a BCD or binary variable into a message. Specify the variable type.

When you press [CTRL][V], the software will ask you to enter 3 parameters:

Parameter	Acceptable values
Variable Size	**1 to 7** (including decimal point)
Decimal Point Position (number of placed after the decimal point)	**0 to 6** (the maximum value is one less than the variable size selected above)
Suppress Zeroes (appearing in front of the first significant digit)	**Yes or No**

The variable symbol _____•____ appears in the message at the variable's location.

The difference between a formatted variable entered with [CTRL][V] and an unformatted variable entered with [CTRL][W] is the flexibility to modify the parameters shown above.

Note that neither AutoRun Messages or Background Messages support inserted variable data.

Change Formatted Variable With [CTRL][F]

Use [CTRL][F] to change the formatting parameters of a variable. Place the cursor under the symbol for the variable you want to change, then press [CTRL][F]. The software will ask you to modify any one or more of the 3 formatting parameters:

Parameter	Acceptable values
Variable Size	**1 to 7** (including decimal point)
Decimal Point Position (number of placed after the decimal point)	**0 to 6** (the maximum value is one less than the variable size selected above)
Suppress Zeroes (appearing in front of the first significant digit)	**Yes or No**

Insert ASCII or BCD Variable With [CTRL][W]

Send a single word ASCII or BCD variable for insertion into a message. Use [CTRL][W] to specify the insertion position. The software will prompt you to specify either ASCII or BCD. The software inserts the symbol for an ASCII or BCD variable (↕).

Note: BCD data consists of 4 digits per word, and ASCII data consists of 2 characters per word.

Note: Variables can be strung together to form compound variables up to 20 ASCII or 40 BCD characters long in any combination as long as the total does not exceed 10 words.

Insert Request for ASCII Input Data With [CTRL][X]

A data request requires that ASCII Input Data, an 8-bit ASCII character, be entered through the keyboard port into the message being displayed.

- When returning ASCII Input Data via RS-485 Port, the message requesting the data must be triggered via the RS-485 Port. This is true for both Parallel Port and Remote I/O units. Data is automatically entered when you press [↵].

  Note: Data is returned to the triggering device without solicitation by the device and without checking that data was received by the device.
- With Remote I/O units, the ASCII input data will be sent via Remote I/O Port to your PLC as part of the Return Message Number Being Displayed (described in the DL40 Plus Dataliner Message Display User Manual, Publication 2706-6.1). Data can be returned to your PLC in:
  - Message/Variable/Slave Run Mode
  - Message/Variable Run Mode
  - Message List Run Mode

  User requested data is sent to the PLC as part of the I/O scan. Up to 20 ASCII characters can be sent with Block Transfer. Up to 12 ASCII characters can be sent with Discrete, depending on rack size.

  The Enter bit will be set only after all ASCII data requested has been put into the message. Data should not be considered valid until the Enter bit is set.

Important: If more ASCII data is requested than can be returned to the PLC, the excess data will be lost.

To enter a data request, place the cursor just after the point where you want to insert the request. Use [CTRL][X] to specify the insertion position. The software inserts the symbol for a single byte data request (↑).

Insert Time Into a Message With [CTRL][T]

To enter the time into a message, place the cursor just after the point where you want the time inserted. Use [CTRL][T] to specify the insertion position. The software will insert the symbol for a time variable (HH:MM:SS).

Note: The time variable occupies 8 of the available 20 characters on a display line.

You can use the time variable in any Run Mode.

Insert Date Into a Message With [CTRL][Y]

To enter the date into a message, place the cursor just after the point where you want the date to appear, and then press [CTRL][Y]. The software will insert the date symbol (DAY MON DT).

Note: The date variable occupies 10 of the available 20 characters on a display line.

You can use one date variable in any message in any Run Mode.

Notes

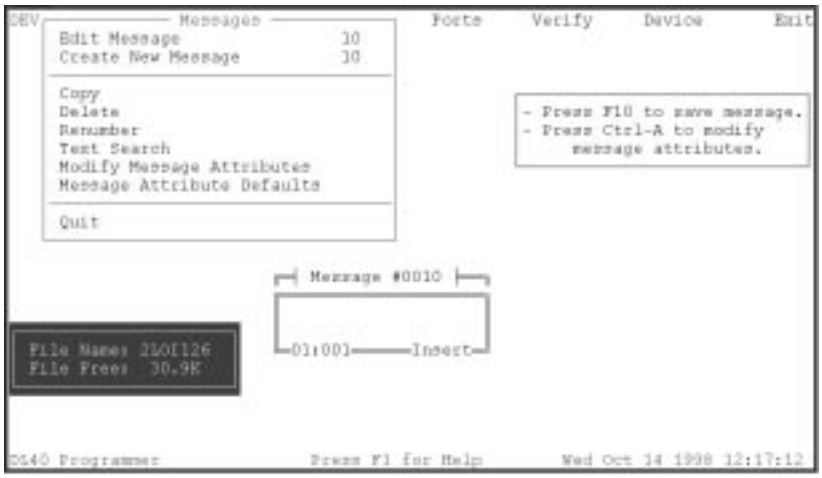
We recommend setting individual message attributes such as Display Message on What Line and Scroll Message before typing in the words of the message. This allows you to verify the placement of characters as you type them.

If Line Usage is other than All Lines, then the display line on the DL40 does not necessarily correspond to the cursor row value shown on the message editing window during editing.

Create New Message

After you have pressed [↵] to select Create New Message from the Messages menu, the message number field (to the right of the menu item) opens. Enter the message number you want to assign to the new message and press [↵] again. The Message Text window (shown below) opens. You can use the Message Text window to develop and format your message text.

Create New Message screen and Message Text window



Notes

We recommend setting individual message attributes such as Display Message on What Line and Scroll Message before typing in the words of the message. This allows you to verify the placement of characters as you type them.

If Line Usage is other than All Lines, then the display line on the DL40 does not necessarily correspond to the cursor row value shown on the message editing window during editing.

If the message number you have assigned is already being used for an existing message, the software will display a warning message. You can then choose between cancelling the creation or editing the existing message.

If adding new messages would exceed the capacity of your DL40, the software will display a warning message and automatically cancel the create function.

Copy Messages Screen

When you select Copy from the Messages menu, the Message Selections/Message Picks window opens. All message numbers in the current file will appear in the Message Selections column.

After you have moved all the messages to be copied into the Message Picks column, press [F10] and the Start/Increment window appears. When it does, press [↵] to open the Starting Message Location field. Input the new message number you want to assign to the first message on your list. Insert a value in the Increment field if you are copying multiple messages.

For example, suppose you want to copy message numbers 1, 2, and 3 to a starting number of 10 and an increment of 5. As a result:

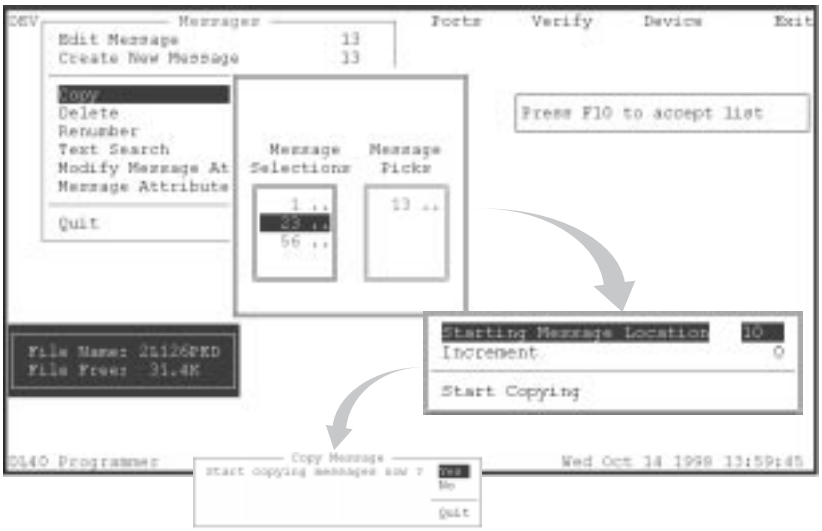
Message 1 is copied as message number 10.

Message 2 is copied as message number 15.

Message 3 is copied as message number 20.

When you press [F10] to accept your Message Picks, the Copy Message confirmation window appears. Use the arrow keys to highlight your choice and press [↵].

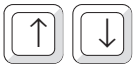
Copy (Messages) screen showing Message Selections, Start/Increment and Confirmation windows.



Special Keys

Use the following special keys on this screen.

Moves the Message Select cursor to the Message Selections or Message Picks column



Moves the Message Select cursor up or down within a column

Moves the highlighted message number from one column to the other

Get Online Help

Accept message picks

Closes the Message Selections/Message Picks window without taking action

Notes

To copy a block of messages, move the cursor to the first message on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last message in the block and press [↵]. The entire block moves to the opposite column.

If you leave the increment set to 0, the spacing between messages is retained. For example, copying message numbers 1, 3, and 7 to message number 10 with an increment of 0 results in new copies with message numbers 10, 12, and 16.

If any of the assigned destination message numbers are already used for an existing message, a warning message is displayed. You can cancel the copy, continue and overwrite the selected existing message, skip the message, or continue and overwrite all existing messages.

Messages are copied with the following conditions:

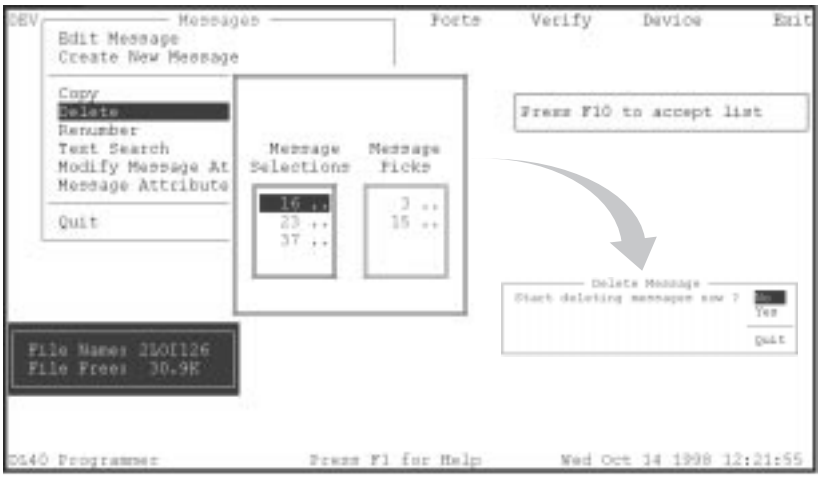
- Messages selected for copying appear on the Message Picks list in the order they were selected. They do not need to be listed in numeric order. The message with the lowest number will always be copied to the Start number, the message with the next lowest number will be copied to the first Increment number, and so on.
- In any of the destination message numbers are already in use by an existing message, a warning appears allowing you to cancel the operation, continue the copy and overwrite the existing message, or continue and overwrite all existing messages.
- If adding new messages exceeds the capacity of your DL40, a warning message is displayed and the copy function cancelled.

Delete Message Screen

When you select Delete from the Messages menu, the Message Selections/Message Picks window opens. All message numbers in the current file appear in the Message Selections column.

Press [F10] to accept your Message Picks, the Delete Message confirmation window appears. Use the arrow keys to highlight your choice and press [↵].

Delete (Message) screen with Delete Message confirmation window



Special Keys

You may use the following special keys on this screen.

← →	Moves the Message Select cursor to the Message Selections or Message Picks column
↑ ↓	Moves the Message Select cursor up or down within a column
↵	Moves the highlighted message number from one column to the other
F1	Get Online Help
F10	Accept message picks
ESC	Closes the Message Selections/Message Picks without changes

Notes

To select a block of messages, move the cursor to the first message on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last message in the block and press [↵]. The entire block will be moved to the opposite column.

Renumber Messages Screen

When you select Renumber from the Messages menu, the Message Selections/Message Picks window opens. All message numbers in the current file appear in the Message Selections column. Move a message from the Message Selections column to the Message Picks column, press [↵].

After you have moved the messages to be renumbered into the Message Picks column, press [F10] and the Start/Increment window appears. When it does, press [↵] to open the Starting Message Location field. Input the new message number you want to assign to the first message on your list. Insert a value in the Increment field if you are renumbering multiple messages.

For example, suppose you want to renumber message numbers 1, 2, and 3 to a starting number of 10 and an increment of 5. As a result:

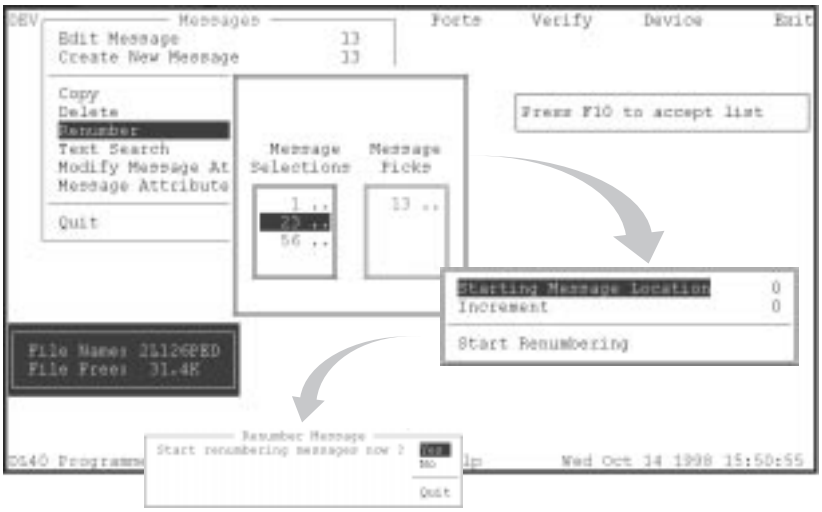
Message 1 becomes message number 10.

Message 2 becomes message number 15.

Message 3 becomes message number 20.

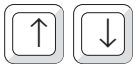
Press [F10] to accept your Message Picks, the Renumber Message confirmation window appears. Use the arrow keys to highlight your choice and press [↵].

Renumber (Messages) – Message Selections/Message Picks



Use the following special keys on this screen.

Moves the Message Select cursor to the Message Selections or Message Picks column



Moves the Message Select cursor up or down within a column

Moves the highlighted message number from one column to the other

Get Online Help

Accept message picks

Closes the Message Selections/Message Picks window without taking action

Notes

To select a block of messages, move the cursor to the first message on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last message in the block and press [↵]. The entire block will be moved to the opposite column.

If you leave the increment set to 0, the spacing between messages will be retained. For example, renumbering message numbers 1, 3, and 7 to message number 10 with an increment of 0 will result in new copies with message numbers 10, 12, and 16.

Messages will be renumbered with the following condition:

- Messages selected for renumbering appear on the Message Picks list in the order they were selected. They do not need to be listed in numeric order. The message with the lowest number is always assigned the Start number, the message with the next lowest number is assigned the first Increment number, and so on.

Text Search Screen

Text Search is a message editing aid that helps you edit a string of characters that appears in several messages. Text Search finds the first occurrence of a string, let you edit the string, and then continues on to the next occurrence.

Strings can consist of combinations of:

- alphabetic characters
- numeric characters
- spaces
- control characters for variables
- ASCII input data
- time
- date
- blinking character delimiter
- [CTRL][V]
- [CTRL][W]
- [CTRL][X]
- [CTRL][T]
- [CTRL][Y]
- [CTRL][B]

Highlight Text Search on the Messages menu, then press [↵]. The Search Text window opens. Enter the string you want to edit and press [↵]. A second window, the Found in Message window opens. Across the top of this window appears the message number of the first message in which the string was found. Inside the window is the message text with the search string text highlighted. You can edit the message text or search for the next occurrence of the string.

Text Search Screen - Search Text and Found in Message windows

Special Keys and Editing Rules

Use the following keys to move through and edit your message text.

↑ ↓	Moves the cursor up or down one line at a time
← →	Moves the cursor right or left without changing the underlying text
Home or End	Moves cursor directly to the beginning or end of the message
PgUp or PgDn	Moves cursor exactly 1 display window forward or backward through the message (except when Scroll attribute is set)
Insert	Toggles between insert and overstrike. If there is a character at the position of the cursor, then the insert mode inserts a character immediately to the left of the cursor. In overstrike mode the character at the cursor position is replaced by any new character you type.
Back Space	Deletes the character to the left of the cursor
DEL	Deletes the character at the cursor position
↵	Inserts a return to start a new line
ALT	Press the [ALT] key while entering a number from the numeric keypad to insert an ASCII or Extended ASCII character.
Any alphabetic or numeric key	Inserts that character at the position of the cursor.
CTRL plus V F W X T or Y	Adds or modify variables (see page 4–12).
CTRL A	Lets you set Message Attributes for *only* the message being created or edited.
CTRL B	Start and end marker for blinking characters. Must be used in pairs. The text between the markers will blink on the message display.
CTRL E	Erases message text, but leaves message number intact. You will be asked to confirm this action before it takes effect.
CTRL N	Centers or un-centers the active message in the Edit Message window.
ESC	Returns to Messages menu. Note that the Abort Message Edit confirmation window appears if you have changed the message in any way. The window asks if you want to discard your changes.
F1	Opens Online Help
F2	Toggles size of Message Text window between 40 and 200 characters
F10	Saves changes and returns to the Messages menu

Modify Message Attributes Screen

Attributes define how a message appears when triggered in the Run Mode. Message Attribute Defaults are automatically assigned to a message when it is created. Using the Offline Programming Software, change the Message Attribute Defaults (as described later in this chapter), or change the attributes for individual messages after they are created.

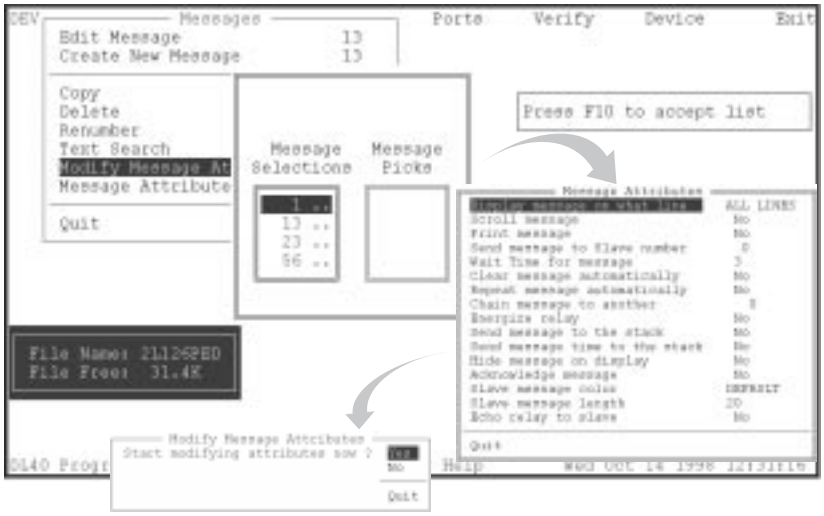
Use Messages→Modify Message Attributes to change the message attributes for one or more existing messages. Current attributes can be default message attributes or message attributes selected with [CTRL][A].

When you select Modify Message Attributes, the Message Selection/Message Picks window opens. All message numbers in the current file will appear in the Message Selections column. To move a message from the Message Selections column to the Message Picks column, press [↵].

After you accept your message picks, the Message Attribute window opens. Use the arrow keys to highlight the attribute you want to change and press [↵]. You will be able to select the new attribute value from a list, or enter a number. Press [↵] apply the new attribute. An explanation of each message attribute is provided on the next page.

When you have finished choosing attribute settings, move the cursor to Quit and press [↵].

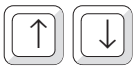
Modify Message Attribute screens



Special Keys

You may use the following special keys on this screen.

Moves the Message Select cursor to the Message Selections or Message Picks column



Moves the Message Select cursor up or down within a column; in the Message Attributes window moves cursor up or down the attribute list

Moves the highlighted message number from one column to the other; in the Message Attributes window lists or accepts attribute choices

Moves cursor to first attribute

Moves cursor directly to Quit

Get Online Help

Accept message picks

Closes the Message Selections/Message Picks window without taking action; exits the Message Attribute window without taking action.

More About Attributes

The modifiable message attributes you can control from the Message Attributes menu appear below:

- Display message on what line
- Scroll message
- Print message
- Send message to Slave number
- Wait Time for message
- Clear message automatically
- Repeat message automatically
- Chain message to another
- Energize relay
- Send message to the stack
- Send message time to the stack
- Hide message on display
- Acknowledge message
- Slave message color
- Slave message length
- Echo relay to slave

Display message on what line

Controls where on the DL40 Plus display the message appears. Options are different for 2 and 4 line versions.

With 2 line units, choose from	With 4 line units, choose from
All Lines	All Lines
Line 1 Only	Line 1 Only
Line 2 Only	Line 2 Only
	Line 3 Only
	Line 4 Only

Scroll message

This message attribute determines whether the message will scroll across the DL40 Message Display. You can activate scrolling only if the Line Usage attribute (described above) has been set to use a single line. Select Yes to activate or No to deactivate.

Print message

If the Print message attribute is set to Yes, then the DL40 Message Display will send any triggered message to a printer through the DL40 RS-232 Port. The message is printed only once (even if the Repeat Message Automatically attribute is active) unless the message contains changed variable data. If new variable data is received while the message is running, then the message is printed again with the new data. Select Yes to activate or No to deactivate.

Send message to Slave (address) number

If you enter a slave number here and a message is triggered via the Remote I/O or Parallel or Keyboard ports, the message will be sent to the slave with the specified address. This attribute is valid for all Run Modes. However, the slave address set when operating in the Message/Variable/Slave Run Mode overrides this attribute.

Important: To send any message to a slave, Ports→RS-485 Port→Port Use must be set to DL Slaves.

If the Repeat message automatically attribute is active, the message is sent to the slave each time it repeats. If the message has embedded variables, it is sent to the slave each time new variable values are received during the message wait time. Possible values for this field include:

Entry:	Which means:
0	Don't send to slave
1 through 126 (addresses 13 & 18 are not valid)	Send to the single identified slave address
127	Send to all slaves

Wait time for message

To the message display, this setting

can mean either:

- If you have activated Scroll message, the value here represents the scrolling rate in tenths of a second. For example, a value of 8 here will result in display of the next new character in a message every 0.8 seconds.
- If Scroll message is not active, then the value here represents the number of seconds a message will appear on the message display. For example, a value of 5 here will assure that the message will appear on screen for 5 seconds whenever it runs.

A value of zero (0) allows the message to remain displayed until the next message trigger is received. This allows the PLC or SLC to control messaging times.

Acceptable values for this field can range from 0 through 31.

Clear message automatically

Sometimes referred to as AutoClear, activating this menu item instructs the DL40 to clear the message from the display after the Wait Time for message has expired even if no other messages have been triggered.

This value applies only to the lines used by a single message. For example, if this message uses only lines 2 and 3, then only lines 2 and 3 will be cleared. Lines 1 and 4 will remain unchanged.

Important: AutoClear de-energizes the alarm relay only if the message which was cleared had energized the relay. A DL50 message display must always be sent a message that de-energizes the relay.

Select Yes to activate or No to deactivate.

Repeat message automatically

This attribute (also referred to as AutoRepeat) causes the display to repeat a message continuously as long as no other messages are in the queue waiting to run. This attribute only functions if the DL40 message display is operating in the Message/Variable/Slave or Message/Variable Run Mode.

Use this attribute when you need to update variables repeatedly within a message.

Select Yes to activate or No to deactivate.

Chain message to another

With this attribute you can link two messages together so that the second message runs automatically after the Wait Time for the message has expired. The second message requires no additional triggering and no special modification of its attributes to respond. Also, the link is independent of the second message, which means that the second message can also run independently under other circumstances.

The second message will have its own attributes, which may be different from those of the first message. There is no limit to the number of messages that can be chained together, and messages can be chained to Special Messages.

Note: The Chain Message to Another attribute is disabled if AutoRepeat is active.

Activate this attribute by entering a valid message number.

Energize relay

Activating this attribute will display the message and energize the DL40 message display's alarm relay whenever the message is triggered.

Important: The alarm relay will not de-energize even after the Wait Time for message has expired. The relay will de-energize when:

- a message is run for which the Energize relay attribute is not activated
- any Special Message runs
- the DL40 message display leaves the Run Mode

Important: AutoClear de-energizes the alarm relay only if the message which is cleared has the Energize relay enabled.

ATTENTION: Use the relay for annunciator purposes only. Do not use it for control.

Select Yes to activate or No to deactivate.

Send message to the stack

When a message is triggered, enabling this attribute places the message number along with any variables on the Historical Events Stack. Stacked messages can also be time stamped with the time the message was triggered and/or run.

Important: Even if AutoRepeat is enabled, the message number (and time) is placed on the Historical Events Stack only once each time the message is triggered and/or run rather than each time it repeats. The message number, variables, and time (if applicable) is placed on the Historical Events Stack while the message is running or repeating only when updates to variables are received by the DL40.

For more information on the Historical Events Stack and time stamping, refer to the DL40 Plus user manual (Publication 2706-6.1).

Select Yes to activate or No to deactivate.

Send message time to the stack

Enabling this attribute allows for time and date stamping of messages sent to the Historical Events Stack.

Select Yes to activate or No to deactivate.

Hide message on display

When activated, the message does not appear on the DL40 Plus, but is sent to a slave display, printer, tape recorder, or placed on the Historical Events Stack. The other attribute settings for the message determine its destination(s).

For example, assume Hide Message On Display is enabled, as are Print Message and Send Message to Slave Number 2. There will be no change on the DL40 display when the message runs, although a copy of the message will be printed and it will be displayed on the slave addressed as 2.

Note: When used with [CTRL][X] (ASCII Input Data), the underscore prompt for this data will still be displayed on the DL40 message display even when Hide Message On Display is active.

Select Yes to activate or No to deactivate.

Acknowledge message

Enabling this attribute instructs the DL40 message display to hold the message until you press the [MSG ACK] button on the front of the DL40 display. The next message is displayed only after the [MSG ACK] button has been pressed.

Note: We recommend that you enable message queueing (from the Options menu) when using the Acknowledge Message attribute.

Select Yes to activate or No to deactivate.

Slave message color

This attribute allows you to control the color of a message sent to a color-capable slave display such as the Dataliner DL50 Tri-Color Marquee Display. The setting options available to you include:

For DL10 or DL20	For *red* DL50	For *color* DL50
Default	Default	Default
		Red
		Green
		Amber

Important: The factory setting for this attribute in the Message Attribute Defaults menu is Default. We recommend leaving that value unchanged. Do not use any selection other than Default for DL10, DL20, or Red DL50 slave displays.

Note: This attribute is not available from the DL40 message display onboard editor. It is only accessible through the Offline Programming Software.

Slave message length

Use the Slave Message Length attribute only with DL50 slave displays. Its purpose is to allow display of 10-character messages on "short" DL50 displays operating in large text mode. Large text mode displays characters that are 4.8 in. (12.2 cm) tall. Applicable displays include Catalog No. 2706-F11J (Red DL50 Message Display) and 2706-F11JC (Tri–color DL50 Message Display).

Acceptable values for this attribute include:

For DL10 or DL20	For DL50
20	20
	10

The factory setting for the Slave Message Length attribute is 20, which means the slave message length will always be set to 20 when you create a message unless you have specified a new setting on the Message Attribute Defaults menu.

Note: This attribute is not available from the DL40 message display onboard editor. It is only accessible through the Offline Programming Software.

Echo relay to slave

The Echo Relay to Slave attribute sends the energize or de-energize relay commands to the DL50 slave addressed in the Send Message to Slave Number attribute. These commands are sent in addition to any specified message text.

After this attribute sends a relay command to the slave, the slave relay will not de-energize until another message is sent to the slave that meets both of the following conditions:

- Energize Relay is set to No (to de-energize the relay)
- Echo Relay to Slave is set to Yes (to send a de-energize command to the slave display)

Acceptable values for this attribute include:

For DL10 or DL20	For DL50
No	No
	Yes

The factory setting for the Echo Relay to Slave attribute is No.

ATTENTION: Use the slave relay for annunciator purposes only. Do not use it for control.

Note: This attribute is not available from the DL40 message display onboard editor. It is only accessible through the Offline Programming Software.

Notes

The attributes shown on the Message Attributes window are those assigned to the message with the lowest message number currently in the Message Picks list.

If Line Usage is other than All Lines, then the display line on the DL40 does not necessarily correspond to the cursor row value shown on the message editing window during editing.

To select a block of messages, move the cursor to the first message on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last message in the block and press [↵]. The entire block will be moved to the opposite column.

The Slave Message Color, Slave Message Length, and Echo Relay to Slave message attribute selections are only available through the Offline Programming Software. You cannot change those attributes with the DL40 Onboard Editor.

Message Attribute Default Screen

Message Attribute Defaults are the attributes assigned to all messages in a file when they are created.

After you have selected Message Attribute Defaults, the Message Attribute Defaults window opens. Use the arrow keys to highlight the attribute you want to change and press [↵]. Select the new attribute value from a list, or enter a number. Press [↵] apply the new attribute.

When you have finished setting attributes, move the cursor to Quit and press [↵].

Message Attribute Default screen

Special Keys

You can use the following special keys on this screen.

↑ ↓	Moves the cursor up or down the attribute list
↵	Lists or accepts attribute choices
Home	Moves cursor to first attribute
End	Moves cursor directly to Quit
F1	Get Online Help
ESC	Closes the Message Attribute Defaults window without taking action.

Notes

Refer to the previous section for descriptions of each message attribute.

If Line Usage is other than All Lines, then the display line on the DL40 does not necessarily correspond to the cursor row value shown on the message editing window during editing.

To select a block of messages, move the cursor to the first message on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last message in the block and press [↵]. The entire block will be moved to the opposite column.

The Slave Message Color, Slave Message Length, and Echo Relay to slave message attribute selections are only available through the Offline Programming Software. You cannot change those attributes with the DL40 Onboard Editor.

Options Menu

The items on the Options menu allow you to control a variety of hardware and display options. Contents of this menu include:

- **Run Mode** – Highlighting Run Mode and pressing [↵] opens a window for choosing a run mode. Refer to Chapter 1 of this manual for additional information on run modes.
- **Newest Message on Line 1** – Selecting Yes displays the newest message to be triggered on line 1, and shifts previously triggered messages down. The message on the bottom line is shifted off the display. This supersedes the message attribute Message on Line # Only. Messages are still displayed in 20–character pieces. This setting is effective with all run modes.
- **Auto Run Message #** – An Auto Run Message is a message that will be displayed when your DL40 is powered up. It can be any message, including a message in the Message List. The Auto Run Message does not support inserted variable data. Specify a message number, or enter 0 for no Auto Run Message.

  Note for Remote I/O units only: If communications between a DL40 and a PLC are not established at startup, the Auto Run Message displays only if Switch 8 on Switch Bank #2 (Last State) is ON.
- **Background Message Number** – The Background Message runs for a minimum of 2 seconds after the last message triggered has finished its display wait time. This message is displayed until a valid message is triggered or until the Run Mode is exited. The Background Message does not support inserted variable data. Specify a message number, or enter 0 for no Background Message.
- **Special Message Start Number** – Special messages provide the ability to monitor and control certain functions of the DL40. These messages can occupy message numbers 1 through 16, 901 through 916, or be disabled. Specify your choice.
- **Message Queueing Enabled** – Choosing Yes allows you to put up to 20 messages in the Queue. These messages are displayed in the order they are received as soon as the previous message has completed running.

  Note: If Message Queueing is turned Off, the queue size is set to 1, which permits only one (1) additional message trigger to be received while the current message is being run or displayed.
- **Time Format** – Choose between AM/PM or 24Hr (military style) time display.
- **Language** – Choose between English, International, or Cyrillic text (DL40 Plus only). Refer to Appendix C.

Options Menu

Special Keys

Use the following special keys on this screen.

↑ ↓	Moves the cursor up or down the attribute list
↵	Lists or accepts attribute choices
Home	Moves cursor to first attribute
End	Moves cursor directly to Quit
F1	Get Online Help
ESC	Closes the Message Attribute Defaults window without taking action.

Ports Menu

The Ports menu allows you to control the communication settings for DL40 Message Display. Select from RS-232, RS-485, or the currently selected trigger port settings active file.

After you have selected Ports, the Ports menu opens. Use the arrow keys to highlight a menu item and press [↵]. You can select a new value from a list, or enter a number. Press [↵] to apply any changes.

The Ports menu

Special Keys

Use the following special keys on this menu.

↑ ↓	Moves the cursor up or down the menu
↵	Lists or accepts choices
Home	Moves cursor to first menu item
End	Moves cursor directly to Quit
F1	Get Online Help
ESC	Closes the Ports menu without taking action.

Notes

Important: The communications parameter settings selected here must match the communications settings of the device that is connected to the DL40 Message Display.

The following lists communications parameters and the choices available for each. Refer to the DL40 Plus user manual (Publication 2706-6.1) for more information on setting RS-232 or RS-485 ports.

RS-232 Port Settings

The following settings are available from this menu item. The default value appears in **bold**.

Parameter	Available choices
Baud Rate	300, 1200, 2400, 4800, **9600**, 19200
Data Bits	7 or **8**
Parity	**None**, Odd, Even
Handshaking	**None**, Software, Hardware
Port Use	**DL40 Programmer**, DL Slaves, Devices Using Open Protocol

RS-485 Port Settings

The following settings are available from this menu item. The default value appears in **bold**.

Parameter	Available choices
Baud Rate	300, 1200, 2400, 4800, **9600**, 19200
Data Bits	7 or **8**①
Parity	**None**, Odd, Even②
Port Use	DL40 Programmer, **DL Slaves**, Devices Using Open Protocol

① This setting should **always** be 8 if Port Use is set to Programmer.

② This setting should **always** be None if Port Use is set to Programmer.

Important: Do not set Port Usage to DL Slaves or Devices Using Open Protocol if downloading message files to the DL40 through the RS-485 Port.

RS-232 Printer Settings

These are the settings of the RS-232 Port when the Print Stack or Print Mode function is active. The following settings are available from this menu.

Parameter	Available choices
Null Count	0 to 255
Width	20 to 132

RS-232 Tape Recorder Settings

Note that RS-232 Tape Recorder Settings are valid only when writing to or reading from a tape drive, and that communications to a tape recorder can be made only via the RS-232 port.

Baud rate is the only modifiable parameter applicable while using a tape recorder. Your choices are listed below. The default value appears in **bold**.

Parameter	Available choices
Baud Rate	300, 1200, 2400, 4800, **9600**

This setting will revert to normal RS-232 Port settings (described above) when the Tape function is finished.

Triggering Port Settings

The parameters presented here will differ between Remote I/O and Parallel Port versions of the DL40 Message Display. The following settings are available from this menu item on Remote I/O units. The default value appears in **bold**.

Parameter	Available choices
Message Format	**Binary**, BCD
Variable Format	**Binary**, BCD
Control-W Format	BCD, **ASCII**
Bit Trigger Priority Section Size	**0** to 31 words
Always Send Clock Data	Yes or **No**①

① If selection is Yes, only clock data will be returned to a PLC no matter what attributes are set or what data is requested.

The following settings are available from this menu item on Parallel Port units. The default value appears in **bold**.

Parameter	Available choices
Message Format	**Binary**, BCD
Variable Format	**Binary**, BCD
Control-W Format	BCD, **ASCII**
High True Logic	**Yes** or No
Using AC/DC Converter	Yes or **No**
Data Hold Time	**40** to 255 msec① or 10 to 255 msec②

① If using AC/DC Converter

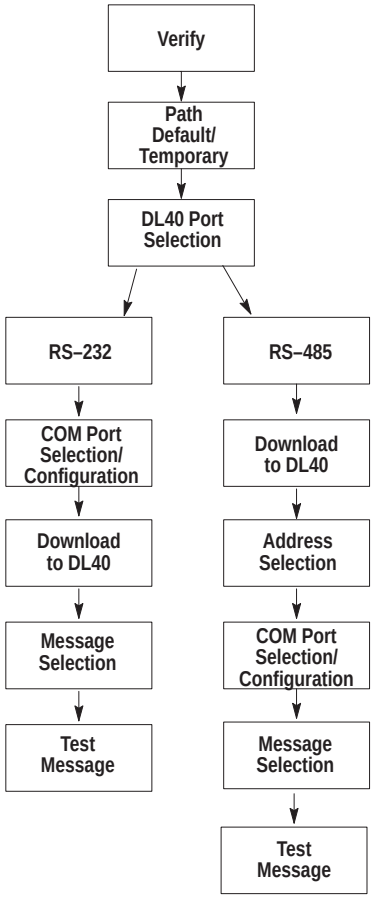
② If not using AC/DC Converter

Verify Menu

After you have finished with the Messages, Options, and Ports menus, you can use the Verify menu to display individual messages on the DL40 to be sure their format is correct. You can even insert binary, BCD, and ASCII variables into the message you are testing.

Important: The file for the message you want to test must exactly match the Internal Application Memory of the DL40 Message Display. To assure that is the case, you must download the file to the DL40 before testing any message in that file.

Depending on whether you select RS-485 or RS-232 communications, you will follow one of two different paths through the Verify menu. The basic steps for each communications protocol appear below.



Highlight Verify, then press [↵]. To change communications method, highlight DL40 Port and press [↵]. Select RS–232 or RS–485 and press [↵]. Highlight Download to DL40 and press [↵].

Verify Menu

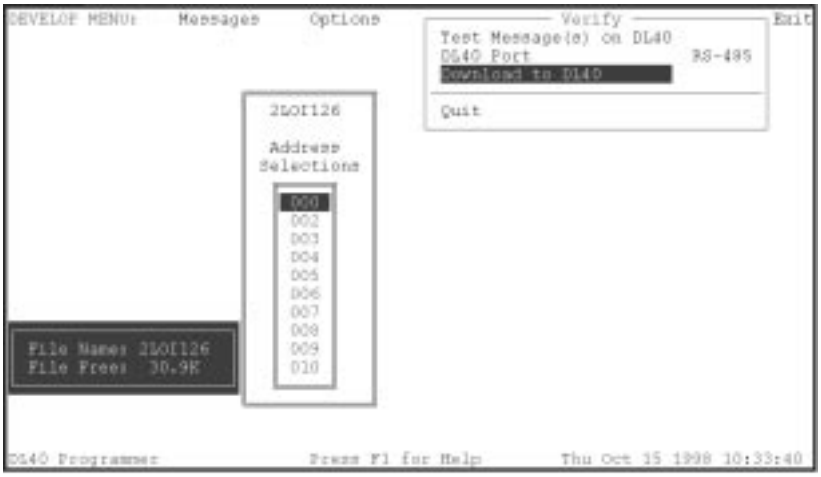
Special Keys

Use the following special keys on the Verify menus.

↑ ↓	Moves the cursor up or down the menu
↵	Lists or accepts choices
Home	Moves cursor to first menu item
End	Moves cursor directly to Quit
F1	Get Online Help
ESC	Closes the menu without taking action.

Communications via RS–485

Test Message Selections (for RS-485 communications)



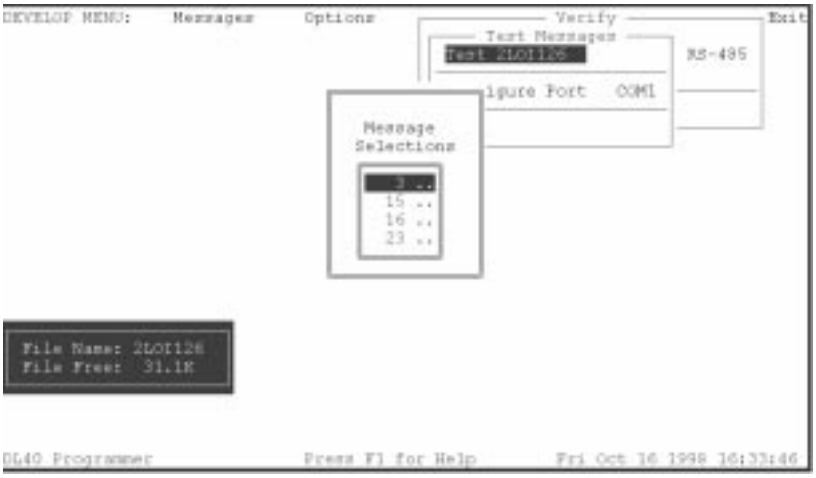
If communicating via RS-485, the Address Selections window opens. Select the DL40 address; then press [↵]. If you need to change your computer's communications port parameters, highlight Configure Port, and press [↵]. Select COM1 or COM2; press [↵]. The Configure Port window opens. Set Computer Address and Baud Rate. **Note**: To change Parity or Data Bits, return to Ports menu.

Highlight Download (filename*)* and press [↵]. After file is downloaded, you will return to the Verify window. Highlight Test Message(s) on DL40; press [↵].

The Message Selections window opens. Highlight number of the message you want to display and press [↵]. Answer Yes to Start Testing Messages Now? Message is displayed on DL40. Press [ESC] to end an Autorepeat message.

Communications via RS–232

Test Message Selection Window (for RS-232 communications)



Communicating via RS–232, no Address Selection window opens. To change your computer's communications port parameters, highlight Configure Port; press [↵]. Select COM1 or COM2; press [↵]. The Configure Port window opens. Set the Baud Rate. **Note:** To change Parity or Data Bits, return to the Ports menu.

Highlight Download (filename) and press [↵]. After file is downloaded, you will return to the Verify window. Highlight Test Message(s) on DL40 and press [↵]. **Note:** Handshake must be set to None. See page 5–4.

The Message Selections window opens. Highlight the number of the message you want to display and press [↵]. Answer Yes to Start Testing Messages Now? The message will be displayed on the DL40. Press [ESC] to end an Autorepeat message.

If your message contains variables, you must put in a value for the variables when testing the message. When you answer Yes to Start Testing Messages Now?, a message text window and an Enter variable window for the first variable opens. Enter value for your first variable; press [↵]. The window for your second variable opens. Continue to enter values for all [CTRL][V] and [CTRL][W] variables.

Note: Values for [CTRL][X] variables are entered into a message using a keyboard while the message is displayed.

Message Text Window

When you answer Yes to Start Testing Messages Now? the message text window shown opens and displays the message contents.

Message Verification Window

Test messages contain the following symbols:

- ↑↑↑ indicates a [Ctrl][X] data request
- ~ ~ indicates a [Ctrl] [V] inserted formatted variable
- ↕ indicates a [Ctrl] [W] inserted ASCII or BCD variable

Device Menu

The Device menu allows you to configure the Offline Programming Software to match the type of DL40 receiving downloaded message files. You can change the selected device at any time the Develop Menu bar appears.

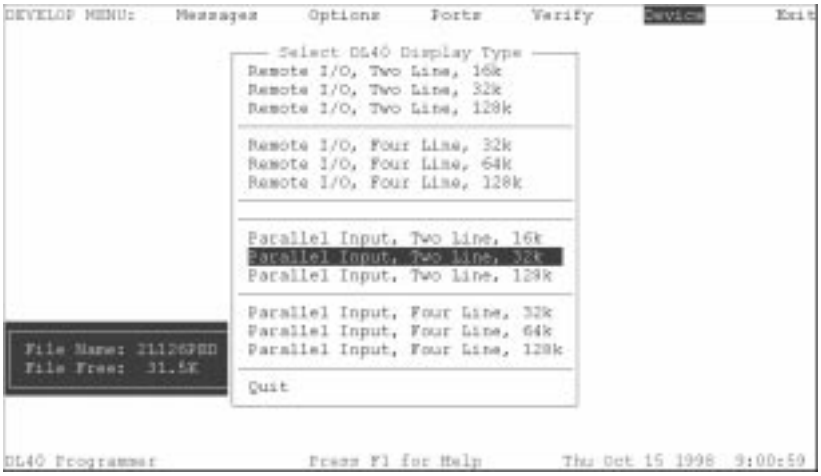
When selecting a new device for an existing file, you will receive error messages if the new device is incompatible with the messages in the file. For example, if a message in the file requires 4 display lines, you will not be able to select a two-line DL40.

This menu automatically pops up after you create a new file, so you need access this menu from the Develop Menu bar only if you need to change the type of DL40 selected.

The variables making up a device specification include:

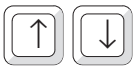
Variable	Available choices
DL40 Type	Remote I/O or Parallel Port
Number of Display Lines	2 or 4
Application Memory Size	16k, 32k, 64k, or 128k

Device Menu


DEVELOP MENU: Messages Options Ports Verify Device Exit
Select DL40 Display Type
Remote I/O, Two Line, 16k
Remote I/O, Two Line, 32k
Remote I/O, Two Line, 128k
Remote I/O, Four Line, 32k
Remote I/O, Four Line, 64k
Remote I/O, Four Line, 128k
Parallel Input, Two Line, 16k
Parallel Input, Two Line, 32k
Parallel Input, Two Line, 128k
Parallel Input, Four Line, 32k
Parallel Input, Four Line, 64k
Parallel Input, Four Line, 128k
Quit
File Name: 21126980
File Free: 31.5K
DL40 Programmer
Press F1 for Help
Thu Oct 15 1998 9:00:59

Special Keys

Use the following special keys on this menu.



Moves the cursor up or down the menu

Lists or accepts choices

Moves cursor to first menu item

Moves cursor directly to Quit

Get Online Help

Closes the menu without taking action.

Downloading/Uploading Message Files

This chapter describes the functions available to you from the Transfer menu. The options available from this menu provide the tools needed to move files and data between the Offline Programming Software and the devices to which it is connected.

To open the Transfer menu, use the right and left arrow keys to highlight Transfer on the Main menu bar, then press [↵]

Section	Page
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Downloading a File using RS-232 or RS-485	5–3
Uploading a File using RS-232 or RS-485	5–6
Downloading a File using Remote I/O (PassThrough)	5–8
Uploading a File using Remote I/O (Passthrough)	5–10
Creating a New Communications File	5–12
Modifying an Existing Communications File	5–16
Sending the Time and Date using RS-232 or RS-485	5–17
Writing a File to Tape	5–18
Reading a File From Tape	5–20

Transfer Menu

Selecting Transfer on the Main menu bar displays the Transfer menu.

Transfer Menu

Special Keys

Use the following special keys on the Transfer menu or on any of the submenus described in this chapter.

↓ ↑	Move the cursor to the desired function
Home	Move the cursor directly to the first menu item
End	Move the cursor directly to the last menu item (Quit)
↵	Selects the item highlighted by the cursor, opens the next menu, or selects from a list of options
ESC	Closes the menu or screen and returns cursor to the previous menu
F1	Get Online Help

Notes

From the Transfer menu you can perform the following activities:

- upload or download a file using RS-232 or RS-485
- upload or download a file using Remote I/O via DH+ or Ethernet PassThrough
- send the time to a DL40 using RS-232 or RS-485
- write or write a file to a tape recorder

You can transfer one file at a time to or from a DL40 or tape recorder.

Downloading a File using RS-232 or RS-485

You can download one file at a time from the Offline Programming Software to the DL40. When you select Download to DL40 (RS-232/RS-485), the Download window opens. Move the cursor to DL40 Port and press [↵]. Select RS-232 or RS-485 from the window and press [↵]. A message flashes briefly to indicate that the Offline Programming Software is saving the setup file.

Download to DL40 screen (using RS-232 or RS-485)

Next move the cursor to Select File and press [↵]. A window opens with the default directory in the upper left corner and a list of the files found in that directory.

Use the arrow keys to move the cursor to the file you want to download and press [↵]. If the name of the file you want to download does not appear here, you may be using the wrong data directory. Change the data directory by backing up and selecting Directory on the Download to DL40 window. When you enter a complete directory path in the Directory window the Offline Programming Software uses that directory as a default for all file activities. Override the Directory setting by typing another complete data directory when naming files. Enter the directory in the format:

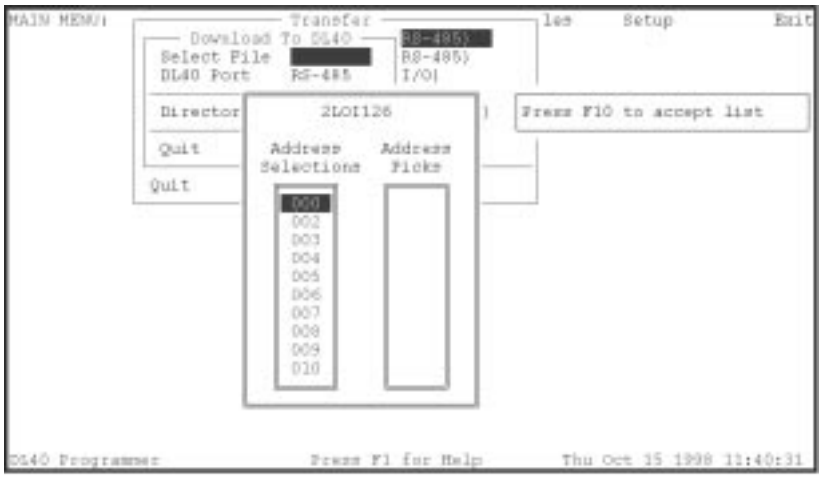
Drive:\Root\Subdir

When you have selected a file, the file name will appear in the Select File field on the Download to DL40 menu.

If downloading via RS-485, the Address Selections/Address Picks window opens after you have selected a file. All message addresses in the selected file will appear in the Address Selections column. Use the up and down arrow keys to highlight an address, then press [↵] to move the address to the Address Picks column. After you have moved all the addresses to be downloaded into the Address Picks column, press [F10].

To select a block of addresses, move the cursor to the first address on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last address in the block and press [↵]. The entire block will be moved to the opposite column.

RS-485 Address Selections/Address Picks window



Use the following special keys on the Address Selections/Address Picks window.

← →	Moves the cursor to the Address Selections or Address Picks column
↑ ↓	Moves the cursor up or down within a column
↵	Moves the highlighted address from one column to the other
Home	Move the cursor directly to the first item
End	Move the cursor directly to the last item
F1	Get Online Help
F10	Accept address picks
ESC	Closes the Address Selections/Address Picks window without taking action

When you have specified a file and (in the case of an RS-485 download) your desired addresses, the Select File window opens.

The Offline Programming Software allows you to download a complete message file or only the currently selected file's parameters. Specify which you want by selecting All or Parameters in the Select Download Type field of the Download to DL40 menu.

Note: To use Verify you must select All in the Select Download Type field.

To configure your computer's communication port, select Configure Port on the Download to DL40 menu, then press [↵]. Select COM1 or COM2, press [↵], and select a baud rate in the Configure Port window.

Note: To change parity or data bits, return to the Develop→Ports menu.

Important: The software warns you if the configuration of the DL40 to which you are writing is different than the configuration of the file you are downloading. Device type, number of lines, and memory size must all match.

Select File screen

When you have finished with the Select File menu, move the cursor to the line containing the currently selected file name and press [↵]. The Download confirmation appears. Select Yes to begin downloading, or No or Quit to cancel the download and return to the Select File menu.

Uploading a File using RS-232 or RS-485

You can upload one file at a time from a DL40 to the Offline Programming Software. When you select Upload from DL40 (RS-232/RS-485), the Upload File from DL40 window appear. Move the cursor to DL40 Port and press [↵]. Select RS-232 or RS-485 from the window and press [↵]. A message will flash briefly to indicate that the Offline Programming Software is saving the setup file.

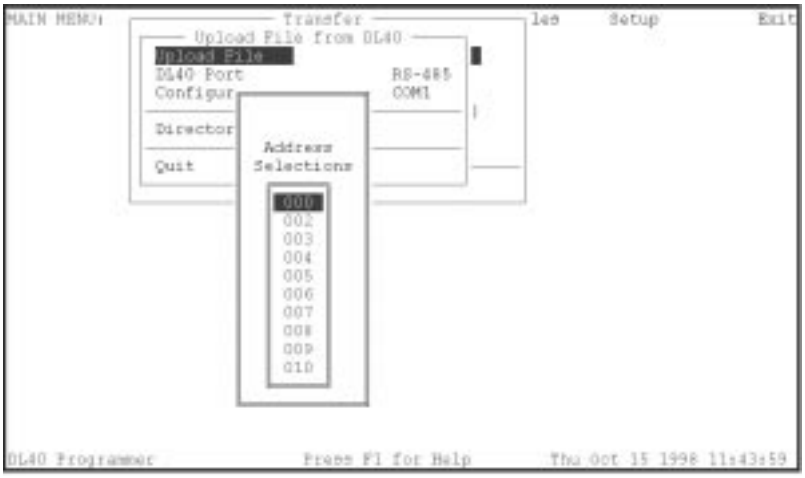
Upload File (via RS-232)

To configure your computer's communication port, select Configure Port on the Upload to DL40 menu, then press [↵]. Select COM1 or COM2, press [↵], specify your computer's address (if using RS-485), and select a baud rate in the Configure Port window.

Note: To change parity or data bits, return to the Develop→Ports menu.

If necessary, you can select Directory to change the currently selected data directory for the uploaded files.

Address Selections Screen when uploading via RS-485



If uploading via RS-485, the Address Selections window opens when you select Upload File. Use the up and down arrow keys to highlight an address, then press [↵] to select the highlighted address and return to the Upload File from DL40 menu.

When you have finished making changes on the Upload File from DL40 menu, move the cursor to the line containing the words Upload File and press [↵]. The Upload confirmation appears. Select Yes to begin uploading, or No or Quit to cancel the upload and return to the Upload File from DL40 menu.

Downloading a File using Remote I/O (PassThrough)

You can download one file at a time from the Offline Programming Software to the DL40. When you select Download to DL40 (Remote I/O) and press [↵], the Download (Remote I/O) window appears.

Important: The DL40 must be operating in Block Transfer mode to use Remote I/O PassThrough.

Download (Remote I/O) file selection screen

Move the cursor to Select File and press [↵]. The program displays a brief message indicating it is searching for data files, then displays the File Selections window. Use the cursor keys to highlight a file name and press [↵]. When you do so, the Message Selections window is replaced by an expanded version of the Download (Remote I/O) window. Included in this window are the address parameters of the currently selected communication (.UDU) file, including DL40 Rack (address), DL40 Group (number), and PLC Address. In addition, the window includes the Download FILENAME item and menu choices allowing you to modify an existing Communication File or create a new one.

Note: There is no default Communication File. You must create at least one file to upload or download over Remote I/O via DH+ or Ethernet.

Download (Remote I/O) screen – expanded

When the settings on the expanded Download (Remote I/O) screen are configured, move the cursor to the Download FILENAME line and press [↵]. Answer Yes when asked if you want to start downloading now. Before you download you will get one of the following warnings, depending on the type and access settings of your DH+ hardware device.

ATTENTION: Before the download begins, you will see one of the following warnings. Which one you see depends on the type and access settings of your DH+ or Ethernet hardware device.

WARNING: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.

WARNING: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.
DH+ Network Access is set to Local.

WARNING: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.
DH+ Network Access is set to Remote (Bridge)
– Local Address is __.
– Remote Bridge Address is __.
Be sure the selected communication file has the correct address parameters, and change them if necessary before continuing.

Note: When downloading via Remote I/O, Download Type is automatically set to All. You can't transfer Parameters only.

Uploading a File using Remote I/O (PassThrough)

You can upload one file at a time from the DL40 to the Offline Programming Software. When you select Upload to DL40 (Remote I/O), the Upload (Remote I/O) window appears.

Upload via Remote I/O screen

Included in this window are the address parameters of the currently selected communication (.UDU) file, including DL40 Rack (address), DL40 Group (number), and PLC Address. In addition, the window includes the Upload File item and menu choices allowing you to modify an existing Communication File or create a new one.

Note: There is no default Communication File. You must create at least one file to upload or download over Remote I/O via DH+ or Ethernet PassThrough.

When the settings on the Upload (Remote I/O) screen are as you want, move the cursor to the Upload File line and press [↵]. Answer Yes when asked if you want to start uploading now. Before you upload, one of the following warnings is displayed, depending on the type and access settings of your DH+ hardware device.

ATTENTION: Before the upload begins, you will see one of the following warnings. Which one you see depends on the type and access settings of your DH+ or Ethernet hardware device.

WARNING: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.

WARNING: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.
DH+ Network Access is set to Local.

WARNING: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.
DH+ Network Access is set to Remote (Bridge)
- Local Address is __.
- Remote Bridge Address is __.

Note: Be sure the selected communication file has the correct address parameters, and change them if necessary before continuing.

Creating a New Communications File

To specify a new Communication File, highlight Create Communication File in either the Download (Remote I/O) or Upload (Remote I/O) menus and press [↵]. You will be asked to specify a file name. To create a file in another directory, highlight Directory and press [↵] and the Program Data directory window will open. Enter the directory in the form:

Drive:\Root\Subdir

Press [↵]. The Communication File window opens. Highlight the parameter you want to set and press [↵]. Select parameter setting and press [↵]. When you highlight Hardware Device and press [↵], a window opens from which you can select the hardware device you are using. Set device parameters.

Communications File screen

Note: For information on PLC and interface board types required for PassThrough file transfers, refer to Chapter 2.

When you highlight an address parameter (DL40 Rack, DL40 Group, PLC Address), you will get the following warning:

ATTENTION: Incorrect address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.

Parameter	Acceptable values
DL40 Rack	0 to 76 (octal)
DL40 Group	0, 2, 4, or 6
PLC Address	0 to 77 (octal)
PLC Type	PLC–5/15/25/40/60 PLC-5/250

The DL40 Rack is the address assigned to the DL40 using DIP Switch Bank #1 on the back of the DL40. Refer to the DL40 Plus user manual (Publication 2706-6.1) for additional information.

The DL40 Group is the First I/O Group Number assigned to the DL40 using DIP Switch Bank #1 on the back of the DL40

The PLC Address is the station number of the PLC-5 on the DH+ link to which the DL40 is attached. This address must match the DIP switch settings on the PLC.

The PLC Type is the type of Allen-Bradley PLC-5 on the DH+ link to which the DL40 is attached. Use the PLC-5/250 choice for a PLC mounted in a Pyramid Integrator chassis.

Selecting a Hardware Device

As shown below, you can select from a number of hardware devices:

Hardware Device window

Your hardware device choices appear in a list.

Parameter	Acceptable values
Hardware Device	1784-KL① 1784-KT, KTX, PCMK① 1770-KF2② 1784-KT2③ ETHERNET

① DH+ Device
② DH+ Device, Serial Interface
③ DH+ Device, Microchannel Bus

Setting Device Parameters for a DH+ Network

Additional transfer parameters may be necessary when you select DH+ communications devices. For card numbers 1784-KT, 1784-KT2, 1784-KL, 1784-KTX, and 1784-PCMK devices, you must specify the DH+ Connection Type and DH+ Network Access.

1784-KT, KTX, PCMK configuration screen for DH+ network

Parameter	Acceptable values
DH+ Connection Type	Direct Multidrop
DH+ Network Access	Local Remote (Bridge)

DH+ Connection Type

Select Direct if your programming computer and your PLC-5 are the only devices on the DH+ link, or if there are multiple devices on the link and your programming computer is the first or the last physical device on the link.

Select Multidrop if there are multiple devices on the link and your programming computer is not first or last physical device on the link.

DH+ Network Access

Select Local if the PLC to which the DL40 is attached is on the same DH+ link as the programming computer.

Select Remote (Bridge) if the PLC to which the DL40 is attached is on a separate DH+ link from the DH+ link to which your programming computer is attached.

If you select Remote (Bridge), then you must specify the Local and Remote Bridge Addresses.

Parameter	Acceptable values
Local Bridge Address	0 to 376 (octal)
Remote Bridge Address	0 to 376 (octal)

The Local Bridge Address is the Data Highway address that you assign to the module connecting the DH+ link on which your programming computer resides to the Data Highway. This address must match the settings of the DIP switches on the module.

The Remote Bridge Address is the Data Highway address that you assign to the module connecting the DH+ link on which the PLC-5 to which the DL40 is connected resides to the Data Highway. This address must match the settings of the DIP switches on the module.

Setting Device Parameters for an Ethernet Network

Additional transfer parameters may be necessary when you select an Ethernet communications device. For Ethernet devices, you must specify the Routing, Pushwheel, and Channel.

Ethernet Parameters configuration screen

Parameter	Acceptable values
Routing	PLC 5E 5130-RM 5130-KA
Pushwheel	1 to 8
Channel	2 3

IP Address
Specify an IP Address which is a decimal number from 0 through 255. Consult your network administrator to obtain an IP Address.

Routing

The Routing value will most often be set to a PCL 5E, which indicates that the Remote I/O link is attached directly to the PLC being addressed. Choose the 5130-KA or 5130-RM selections if you are performing transfers via a PLC-5/250 in a Pyramid Integrator chassis.

Pushwheel

A Pushwheel must be specified when the 5130-KA module has been selected in the Routing field. This value should match the configuration of the PLC-5/250.

Channel

You need to specify a Channel if you select either a 5130-KA or 5130-RM module. The value in this field should be either 2 or 3 as previously selected on the PLC-5/250.

After all parameters are set, highlight Quit and press [↵].

Modifying an Existing Communications File

Select Modify Communications File to change the parameters specified for the currently selected communications file. The name of the currently selected communications file appears in the Select Communication File field at the top of the Download or Upload menu.

When you select Modify Communications File, the Communication File window opens. This window contains all the settings for the currently selected communications file, which you can modify. Note that when you save the modifications to an existing file, you overwrite the previous contents of that file.

Sending the Time and Date to a DL40 Via RS-232 or RS-485

You can send your computer's system time and date to the DL40. When you select Send Clock to DL40 (RS-232/RS-485), the Send Clock to DL40 DL40 menu will appear. Move the cursor to DL40 Port and press [O]. Select RS-232 or RS-485 from the window and press [↵]. A message flashes briefly to indicate that the Offline Programming Software is saving the setup file.

Send Clock To DL40 screen

To configure your computer's communication port, select Configure Port, then press [↵]. Select COM1 or COM2, press [↵], specify your computer's address (if using RS-485), and select a baud rate in the Configure Port window.

Move the cursor to the line containing the words Send Clock and press [↵]. The Send Clock confirmation appears. Select Yes to begin, or No or Quit to cancel the download and return to the Send Clock to DL40 menu.

If using RS-485, the Address Selections/Address Picks window opens. All message addresses in the selected file will appear in the Address Selections column. Use the up and down arrow keys to highlight an address, then press [↵] to move the address to the Address Picks column. After you have moved all the addresses to be updated with new time and date into the Address Picks column, press [F10].

To select a block of addresses, move the cursor to the first address on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last address in the block and press [↵]. The entire block is moved to the opposite column.

Writing a File to Tape

You can download one file at a time from the Offline Programming Software to a tape recorder. When you select Write to Tape Recorder, the Write To Tape window appears.

Write To Tape menu

Next move the cursor to Select File and press [↵]. The File Selections window appears with the default directory in the upper left corner and a list of the files found in that directory.

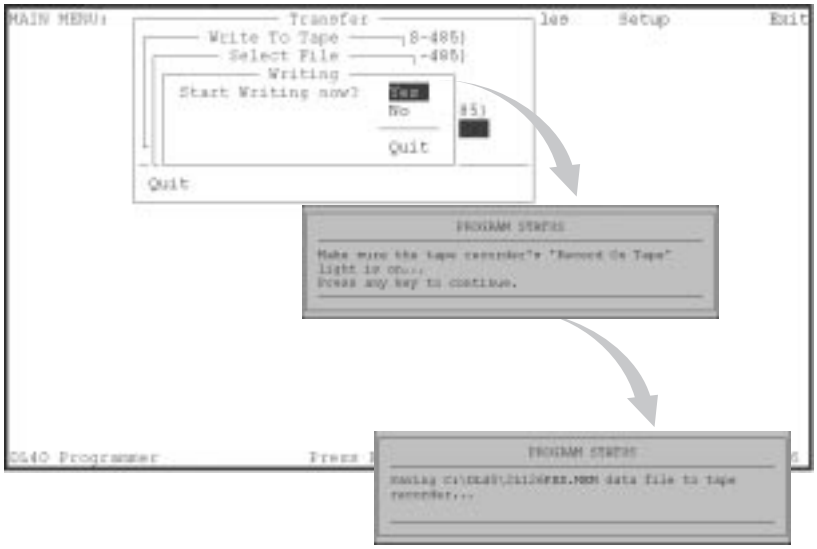
File Selections window

Use the arrow keys to move the cursor to the file you want to download to tape and press [↵]. If the name of the file you want to download does not appear here, you may be using the wrong data directory. You can change the data directory by backing up and selecting Directory on the Write To Tape menu. When you enter a complete directory path in the Directory window, the Offline Programming Software uses that directory as a default for all file activities. You can override the Directory setting by typing another complete data directory when naming files. Enter the directory in the format:

Drive:\Root\Subdir

When you have selected a file, the wording in the Select File field on the Write To Tape menu will change to the word Write followed by the file name you have selected. The writing confirmation appears. Select Yes to begin, or No or Quit to cancel the download and return to the Select File menu.

Write to Tape menus and screens

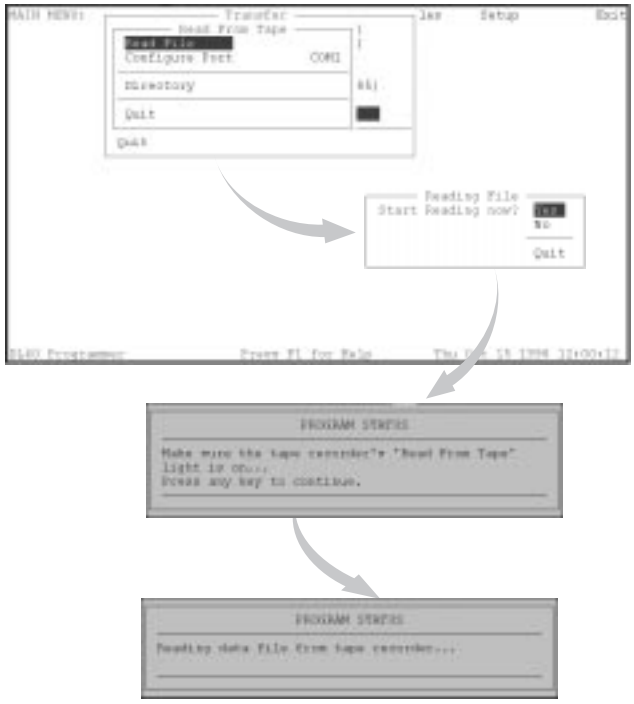


If you pressed Yes to begin writing to tape, the first Program Status window appears. Make sure your tape recorder is ready and the tape is rewound. Follow the instructions in the window, then press any key to continue. The Program Status window appears, indicating that the write has begun.

Reading a File from Tape

You can upload one file at a time from a tape recorder to the Offline Programming Software. When you select Read From Tape Recorder, the Read From Tape window opens.

Read From Tape menus and screens



To configure your computer's communication port, select Configure Port, then press [↵]. Select COM1 or COM2, press [↵], and select a baud rate in the Configure Port window.

When you have initiated the upload, the Reading File confirmation appears. Select Yes to begin, or No or Quit to cancel the download and return to the Read from Tape menu.

If you pressed Yes to begin reading from tape, the first Program Status window appears. Make sure your tape recorder is ready and the tape is rewound. Press the recorder's READ FROM TAPE button, then press any key to continue. The Program Status appears, indicating that the write has begun.

After the file is uploaded, the Save Data File As window will open showing the directory and filename of the uploaded file. You can override the displayed data directory by typing another complete data directory when naming files. Enter the directory in the format:

Drive:\Root\Subdir\Filename

Press [↵] to accept the new directory and file name.

Getting Reports

This chapter describes the functions available to you from the Reports menu. As its name implies, the options available from this menu provide the tools needed to control the Offline Programming Software's reporting functions.

To open the Reports menu, use the right and left arrow keys to highlight Reports on the Main menu bar, then press [↵].

Section	Page
Reports Menu	6–2
Select File Submenu	6–4
Configure Ports Submenu	6–5
Starting the Print Job	6–6

Reports Menu

Selecting Reports on the Main menu bar displays the Reports menu. You can print one file at a time on your printer.

Highlight Select File, then press [↵]. A message will appear briefly indicating that the software is looking for data files, then the File Selections window will open showing a list of all Message Files found under the current directory. Select the file you want to print, then press [↵]. A message will appear briefly indicating that the software is reading the data files, then the Select File menu appears.

Reports menu with File Selections pop–up window

Special Keys

You may use the following special keys on the Reports menu or on any of the submenus described in this chapter.

↓ ↑	Move the cursor to the desired function
Home	Move the cursor directly to the first menu item
End	Move the cursor directly to the last menu item (Quit)
↵	Selects the item highlighted by the cursor, opens the next menu, or selects from a pop-up list of options
ESC	Closes the menu or screen and returns cursor to the previous menu
F1	Get Online Help

Notes

Change data path directories by selecting Reports→Directory. When you enter a directory path, the Offline Programming Software uses that path as a default for all file activities. When creating a new data path, specify the path in the format:

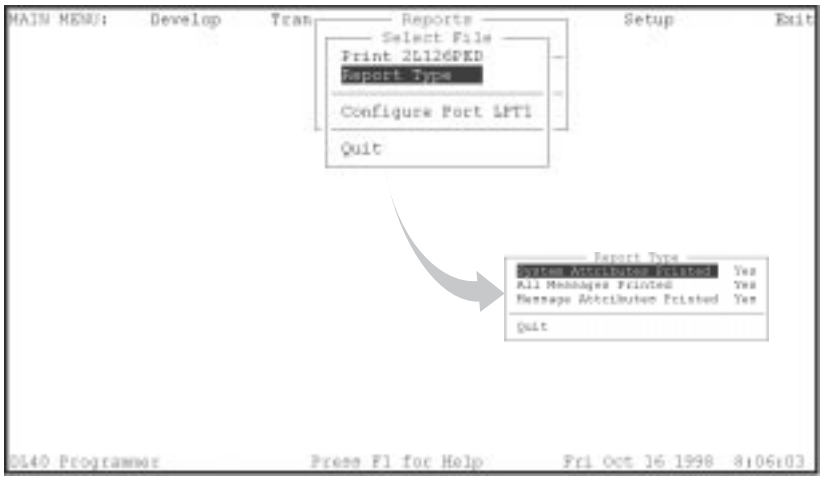
Drive:\Directory\Directory1\Directory2

You can change the directory path at any time the Reports menu is displayed. The change becomes effective immediately.

Select File Submenu

In the Select File menu, move the cursor to the Report Type field and press [↵]. The Report Type menu opens.

Select File menu



Options available to you on the Report Type window include:

Parameter	Acceptable values
System Attributes Printed	**Yes** or No
All Messages Printed	**Yes** or No
Message Attributes	**Yes** or No

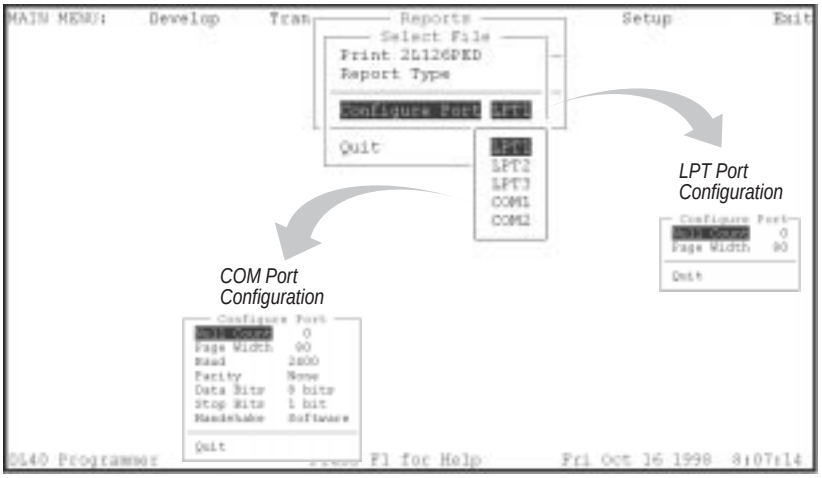
When you have set the Report Type parameters to meet your needs, press [↵] to accept your settings and close the Report Type menu.

Configure Ports Submenu

Choose Configure Port from the Select File and press [↵] to identify and configure the communication port to which your printer is connected. A window appears listing the ports available to you. Use the up and down arrow keys to select a port and press [↵].

Depending on which type of port you select, one of two windows open. One window allows you to set communication parameters for a COM port, and the other allows you to set the parameters for an LPT port.

Configure Ports menus



The parameters for LPT ports include:

Parameter	Acceptable values
Null Count	**0**
Page Width	**20** to 132

The parameters for COM ports include:

Parameter	Acceptable values
Null Count	**0**
Page Width	**20** to 132
Baud	110, 150, 300, 600, **1200**, 2400, 4800, 9600
Parity	**None**, Odd, Even
Data Bits	7 bits, **8 bits**
Stop Bits	**1 bit**, 2 bits
Handshake	None, **Software**, Hardware

After setting the printer port options, press [END] or use the down arrow key to move to the last line of the window and highlight Quit. Press [↵] to close the Configure Port window and return to the Select File menu.

Starting the Print Job

Check to make sure your printer is properly connected and turned ON. Move the cursor to the Print FILENAME line on the Select File menu and press [↵].

Managing Message Files

This chapter describes the functions available to you from the Files menu. On this menu you will find the tools you need to work with application files.

From the File menu you can perform the following activities:

- copy files from one directory to another
- delete files
- rename files
- convert DL20 Message Display application files to make them usable with a DL40
- change working directories

This chapter contains the following topics:

Section	Page
Files Menu	7–2
Select Files Menu	7–3
File Selections/File Picks Window	7–4
Copy File(s)	7–5
Delete File(s)	7–6
Rename File(s)	7–6
Convert DL20 File(s)	7–7

Files Menu

Selecting Files on the Main menu displays the Files menu.

Files menu

Special Keys

Use the following special keys on the Files menu or on any of the submenus described in this chapter.

↓ ↑	Move the cursor to the desired function or up and down a column in the File Selections/File Picks window.
← →	In the File Selections/File Picks window, moves the cursor from one column to the other
Home	Move the cursor directly to the first menu item
End	Move the cursor directly to the last menu item (Quit)
↵	Selects the item highlighted by the cursor, opens the next menu, or selects from a pop-up list of options
ESC	Closes the menu or screen and returns cursor to the previous menu
F1	Get Online Help
F10	In the File Selections/File Picks window, accepts picks

Select Files Menu

Before copying, deleting, renaming, or converting files you must first select the files you want to affect. To do so, move the cursor to Select File(s) and press [↵]. The Select File(s) menu opens. From this menu choose from a list of:

- DL40 message files only
- communications files only
- all DOS files in the currently selected directory

If necessary, select Directory to change the currently selected data path for the uploaded files.

Highlight one of the menu items and press [↵]. The File Selections/File Picks window opens.

Select Files menu

File Selections/File Picks Window

After you have selected the file type you want from the Select File(s) menu, the File Selections/File Picks window opens. Listed here are all the files in the currently selected directory that match the file type specified. Use the up and down arrow keys to highlight a file name, then press [↵] to move the file name to the File Picks column. After you have moved the names of all the files you want to work with into the File Picks column, press [F10].

To select a block of file names, move the cursor to the first name on the block and press [CTRL][B] to mark the beginning of the block. Then move the cursor to the last file name in the block and press [↵]. The entire block moves to the opposite column.

After you have moved the names of all the files you want to work with into the File Picks column, press [F10] to accept your selection. The File Selections/File Picks Column disappears, and the Files top level menu reappears.

Note that you cannot copy, delete, rename, or convert files unless you have selected at least one file name through the Select File(s) menu. If a selection is currently in effect, you will see the small File Picks window in the upper left corner of the screen listing the current selections. The File Picks window appears only if you have selected one or more files.

File Selections/File Picks window

Copy File(s)

Copy File(s) lets you perform the following actions:

- copy a **single** file within the same directory. You must specify a new filename for the copy.
- copy a **single** file to a different drive and/or directory. Specify a new filename for the copy or retain the original filename. Two copies of the file exist when the copy is completed.
- copy **multiple** files to a different drive and/or directory. Original file names will always be retained when copying multiple files.

To copy the selected file(s), move the cursor to Copy File(s) and press [↵]. The Copy Files window opens.

Copy Files window

File Picks pop-up window indicates what files are currently selected.

Copying single files

To copy your selection to a new drive and/or directory, type the destination in the Copy Files window in the format:

Drive:\directory\filename

To copy your selection to the same drive and directory, you do not need to specify a drive or directory. Instead, type only the new filename in the Copy Files window in the format:

filename

Press [↵] to accept your destination and start the copy.

Copying multiple files

To copy your selections to a new drive and/or directory, type the destination in the Copy Files window in the format:

Drive:\directory

Press [↵] to accept your destination and start the copy.

Delete File(s)

To delete the currently selected file(s), move the cursor to Delete File(s) and press [↵]. The File Delete confirmation window opens Select Yes to begin deleting, or No or Quit to cancel the deletion and return to the Files menu.

File Delete confirmation pop-up window

Rename File(s)

Rename File(s) lets you perform the following actions:

- rename a **single** file within the same directory.
- move a **single** file to a different drive and/or directory. You may specify a new filename for the copy or retain the original filename. Note that this is a **move** and not a copy. Only a single copy of the file exists when the move is complete.
- move **multiple** files to a different drive and/or directory. Original file names will always be retained when moving multiple files.

To rename or move the selected file(s), move the cursor to Rename File(s) and press [↵]. The Rename Files window opens.

Rename File window

Renaming or moving single files

To rename or move your selection to a new drive and/or directory, type the destination in the Rename Files window in the format:

Drive:\directory\filename

To rename your selection without moving it, type only the new filename in the Rename Files window in the format:

filename

Press [↵] to accept the new name.

Moving multiple files

To move your selections to a new drive and/or directory, type the destination in the Rename Files window in the format:

Drive:\directory

Press [↵] to accept your destination and move the files.

Convert DL20 File(s)

Convert DL20 File(s) lets you perform the following actions:

- convert a **single** DL20 S Record file to a DL40 file residing in the original directory. You may specify a new filename or retain the original filename.
- convert a **single** DL20 S Record file to a different drive and/or directory. You may specify a new filename for the converted file or retain the original filename.
- convert **multiple** DL20 S Record files to DL40 files. Original file names will always be retained, but the file name extension will be changed to .MEM.

To convert the selected file(s), move the cursor to Convert DL20 File(s) and press [↵]. The Conversion Destination File window opens.

Conversion Destination File pop-up window

Converting single files

To convert your selection type the conversion destination in the Conversion Destination File window in the format:

Drive:\directory\filename

Do not provide a file name extension. The Offline Programming Software automatically adds the extension .MEM to the file name.

To convert your selection without moving it type only the new filename in the Conversion Destination File window in the format:

filename

Do not provide a file name extension. The Offline Programming Software automatically adds the extension .MEM to the file name. Press [↵] to accept the new name.

Converting multiple files

To convert your selections to a new drive and/or directory, type the destination in the Conversion Destination Files window in the format:

Drive:\directory

Do not provide a file name extension. The Offline Programming Software automatically adds the extension .MEM to the file name. Press [↵] to accept your destination and move the files.

Message Display Worksheets

Using the Worksheets

Use a photocopy of this worksheet to record the message number and content of the messages you create with the Offline Programming Software. For your convenience, we've provided worksheets for both two-line and four-line versions of the DL40.

Two Line Worksheet

MESSAGE NUMBER _____

MESSAGE NUMBER _____

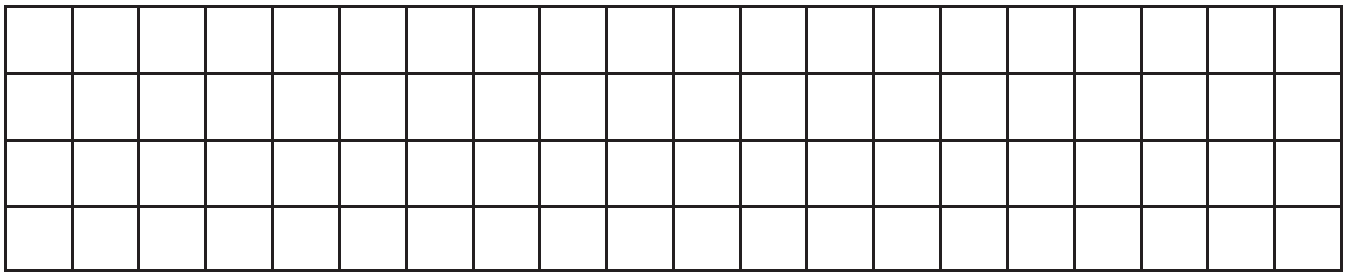
MESSAGE NUMBER _____

MESSAGE NUMBER _____

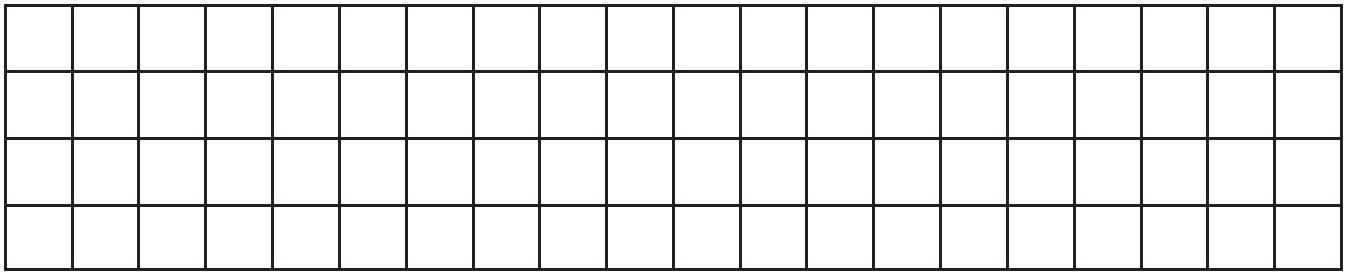
MESSAGE NUMBER _____

Four Line Worksheet

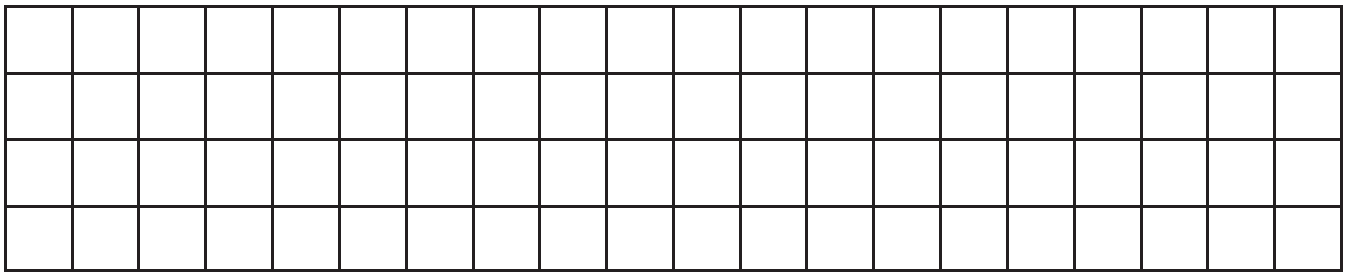
MESSAGE NUMBER _____



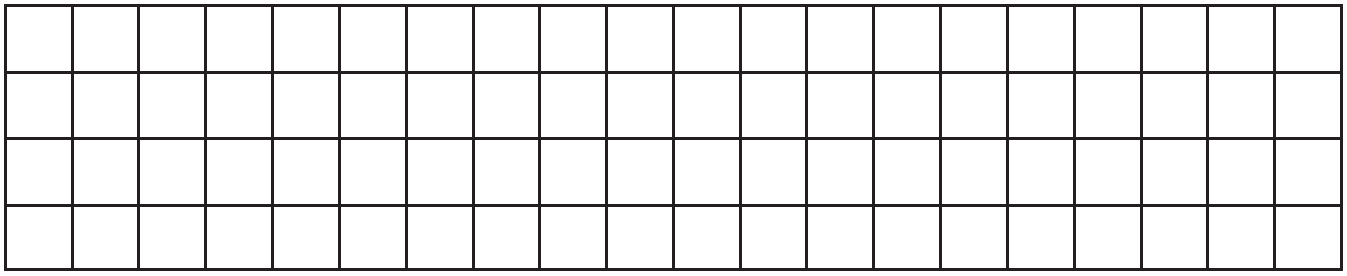
MESSAGE NUMBER _____



MESSAGE NUMBER _____

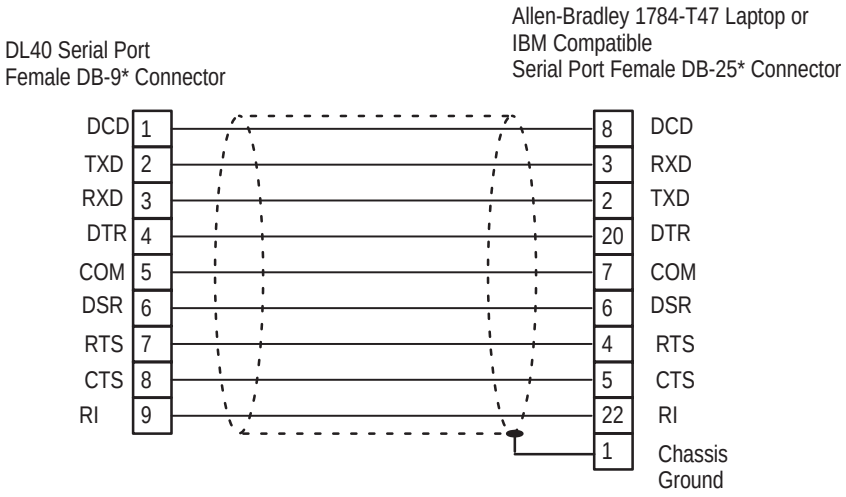


MESSAGE NUMBER _____



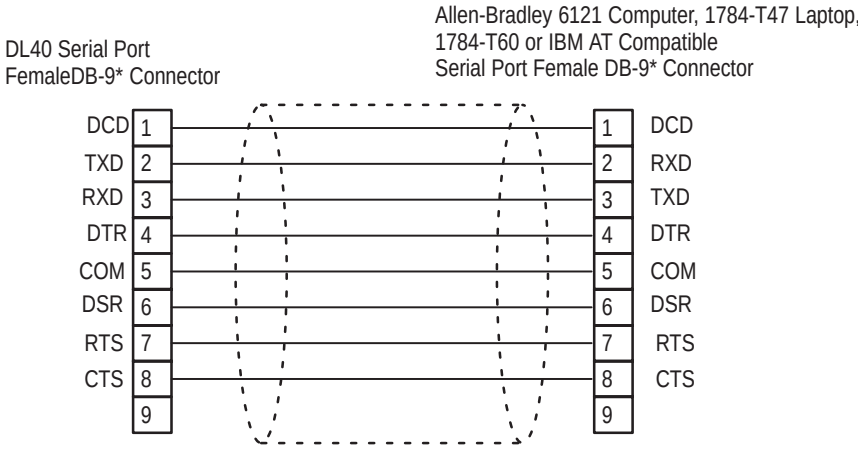
Cables

2706-NC12



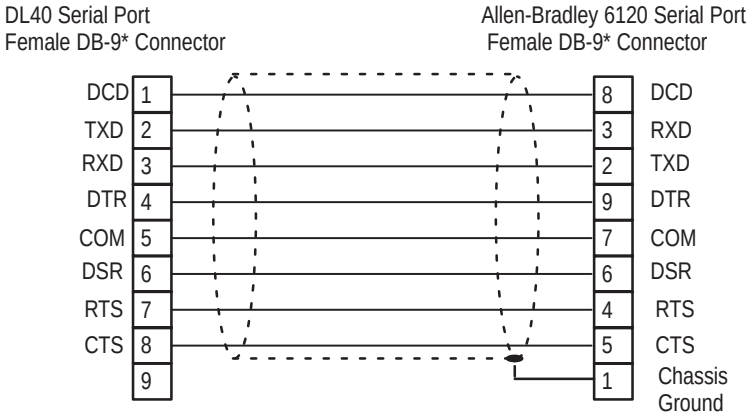
***** Gender specified is for the cable connectors.

2706-NC13



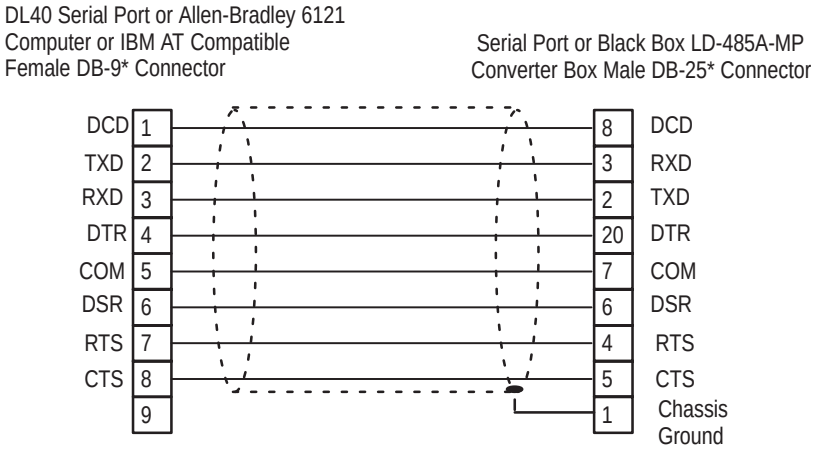
***** Gender specified is for the cable connectors.

2706-NC14



***** Gender specified is for the cable connectors.

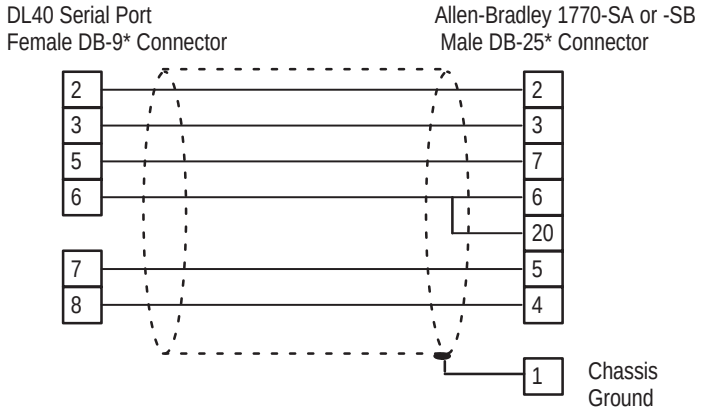
2706-NC15



***** Gender specified is for the cable connectors.

DL40 to Allen-Bradley 1770-SA or -SB Tape Recorder

This cable must be assembled by the user.



***** Gender specified is for the cable connectors.

ASCII Character Sets

ASCII Character Set

Dec.	Oct.	Hex	Char	Control Code	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char
0	000	00	NUL	CTRL @	32	040	20	SP	64	100	40	@	96	140	60	`
1	001	01	SOH	CTRL A	33	041	21	!	65	101	41	A	97	141	61	a
2	002	02	STX	CTRL B	34	042	22	"	66	102	42	B	98	142	62	b
3	003	03	ETX	CTRL C	35	043	23	#	67	103	43	C	99	143	63	c
4	004	04	EOT	CTRL D	36	044	24	$	68	104	44	D	100	144	64	d
5	005	05	ENQ	CTRL E	37	045	25	%	69	105	45	E	101	145	65	e
6	006	06	ACK	CTRL F	38	046	26	&	70	106	46	F	102	146	66	f
7	007	07	BEL	CTRL G	39	047	27	'	71	107	47	G	103	147	67	g
8	010	08	BS	CTRL H	40	050	28	(	72	110	48	H	104	150	68	h
9	011	09	HT	CTRL I	41	051	29	)	73	111	49	I	105	151	69	i
10	012	0A	LF	CTRL J	42	052	2A	*	74	112	4A	J	106	152	6A	j
11	013	0B	VT	CTRL K	43	053	2B	+	75	113	4B	K	107	153	6B	k
12	014	0C	FF	CTRL L	44	054	2C	,	76	114	4C	L	108	154	6C	l
13	015	0D	CR	CTRL M	45	055	2D	-	77	115	4D	M	109	155	6D	m
14	016	0E	SO	CTRL N	46	056	2E	.	78	116	4E	N	110	156	6E	n
15	017	0F	SI	CTRL O	47	057	2F	/	79	117	4F	O	111	157	6F	o
16	020	10	DLE	CTRL P	48	060	30	0	80	120	50	P	112	160	70	p
17	021	11	DC1	CTRL Q	49	061	31	1	81	121	51	Q	113	161	71	q
18	022	12	DC2	CTRL R	50	062	32	2	82	122	52	R	114	162	72	r
19	023	13	DC3	CTRL S	51	063	33	3	83	123	53	S	115	163	73	s
20	024	14	DC4	CTRL T	52	064	34	4	84	124	54	T	116	164	74	t
21	025	15	NAK	CTRL U	53	065	35	5	85	125	55	U	117	165	75	u
22	026	16	SYN	CTRL V	54	066	36	6	86	126	56	V	118	166	76	v
23	027	17	ETB	CTRL W	55	067	37	7	87	127	57	W	119	167	77	w
24	030	18	CAN	CTRL X	56	070	38	8	88	130	58	X	120	170	78	x
25	031	19	EM	CTRL Y	57	071	39	9	89	131	59	Y	121	171	79	y
26	032	1A	SUB	CTRL Z	58	072	3A	:	90	132	5A	Z	122	172	7A	z
27	033	1B	ESC	CTRL [	59	073	3B	;	91	133	5B	[	123	173	7B	{
28	034	1C	FS	CTRL \	60	074	3C	<	92	134	5C	\	124	174	7C	|
29	035	1D	GS	CTRL]	61	075	3D	=	93	135	5D	]	125	175	7D	}
30	036	1E	RS	CTRL ^	62	076	3E	>	94	136	5E	^	126	176	7E	~
31	037	1F	US	CTRL _	63	077	3F	?	95	137	5F	_	127	177	7F	⌂

Extended ASCII Character Set

To enter an extended ASCII character, use the [ALT] key in combination with the numeric keypad section on your keyboard. Hold down the [ALT] key, then enter one of the decimal values found in the extended ASCII character chart below. The selected character will appear in the offline message window when you release the [ALT] key. Extended ASCII characters are not available with the onboard editor.

Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char
128	200	80	Ç	160	240	A0	á	192	300	C0	└	224	340	E0	α
129	201	81	ü	161	241	A1	í	193	301	C1	┴	225	341	E1	β
130	202	82	é	162	242	A2	ó	194	302	C2	┬	226	342	E2	Γ
131	203	83	â	163	243	A3	ú	195	303	C3	├	227	343	E3	π
132	204	84	ä	164	244	A4	ñ	196	304	C4	─	228	344	E4	Σ
133	205	85	à	165	245	A5	Ñ	197	305	C5	┼	229	345	E5	σ
134	206	86	å	166	246	A6	ª	198	306	C6	╞	230	346	E6	µ
135	207	87	ç	167	247	A7	º	199	307	C7	╟	231	347	E7	τ
136	210	88	ê	168	250	A8	¿	200	310	C8	╚	232	350	E8	Φ
137	211	89	ë	169	251	A9	⌐	201	311	C9	╔	233	351	E9	Θ
138	212	8A	è	170	252	AA	¬	202	312	CA	╩	234	352	EA	Ω
139	213	8B	ï	171	253	AB	1/2	203	313	CB	╦	235	353	EB	δ
140	214	8C	î	172	254	AC	1/4	204	314	CC	╠	236	354	EC	∞
141	215	8D	ì	173	255	AD	¡	205	315	CD	═	237	355	ED	∅
142	216	8E	Ä	174	256	AE	<<	206	316	CE	╬	238	356	EE	∈
143	217	8F	Å	175	257	AF	>>	207	317	CF	╧	239	357	EF	∩
144	220	90	É	176	260	B0	▓	208	320	D0	╨	240	360	F0	≡
145	221	91	æ	177	261	B1	▒	209	321	D1	╤	241	361	F1	±
146	222	92	Æ	178	262	B2	▓	210	322	D2	╥	242	362	F2	≥
147	223	93	Ô	179	263	B3	│	211	323	D3	╙	243	363	F3	≤
148	224	94	ö	180	264	B4	┤	212	324	D4	╘	244	364	F4	⌠
149	225	95	ò	181	265	B5	╡	213	325	D5	╒	245	365	F5	⌡
150	226	96	û	182	266	B6	╢	214	326	D6	╓	246	366	F6	÷
151	227	97	ù	183	267	B7	╖	215	327	D7	╫	247	367	F7	≈
152	230	98	ÿ	184	270	B8	╕	216	330	D8	╪	248	370	F8	°
153	231	99	Ö	185	271	B9	╣	217	331	D9	┘	249	371	F9	•
154	232	9A	Ü	186	272	BA	║	218	332	DA	┌	250	372	FA	·
155	233	9B	¢	187	273	BB	╗	219	333	DB	▮	251	373	FB	√
156	234	9C	£	188	274	BC	╝	220	334	DC	▪	252	374	FC	n
157	235	9D	¥	189	275	BD	╜	221	335	DD	▌	253	375	FD	²
158	236	9E	Pt	190	276	BE	╛	222	336	DE	▐	254	376	FE	▪
159	237	9F	ƒ	191	277	BF	┐	223	337	DF	▪	255	377	FF	

Cyrillic Character Set

The DL40 Plus Dataliner supports both Cyrillic and English alphabet characters. The Cyrillic characters include the 32 standard Cyrillic alphabetic characters. The English characters include the standard 26 English alphabet characters, numbers, and punctuation marks. Refer to the Cyrillic character reference chart that follows for keycode assignments.

Dec.	Oct.	Hex.	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex	Char	Dec.	Oct.	Hex.	Char
128	200	80	Д	160	240	A0	а	192	300	C0	└	224	340	E0	р
129	201	81	Б	161	241	A1	б	193	301	C1	┴	225	341	E1	с
130	202	82	В	162	242	A2	в	194	302	C2	┬	226	342	E2	т
131	203	83	Г	163	243	A3	г	195	303	C3	├	227	343	E3	у
132	204	84	Д	164	244	A4	д	196	304	C4	─	228	344	E4	ф
133	205	85	Е	165	245	A5	е	197	305	C5	┼	229	345	E5	х
134	206	86	Ж	166	246	A6	ж	198	306	C6	╞	230	346	E6	ц
135	207	87	З	167	247	A7	з	199	307	C7	╟	231	347	E7	ч
136	210	88	И	168	250	A8	и	200	310	C8	╚	232	350	E8	ш
137	211	89	Й	169	251	A9	й	201	311	C9	╔	233	351	E9	щ
138	212	8A	К	170	252	AA	к	202	312	CA	╩	234	352	EA	ъ
139	213	8B	Л	171	253	AB	л	203	313	CB	╦	235	353	EB	ы
140	214	8C	М	172	254	AC	м	204	314	CC	╠	236	354	EC	ь
141	215	8D	Н	173	255	AD	н	205	315	CD	═	237	355	ED	э
142	216	8E	О	174	256	AE	о	206	316	CE	╬	238	356	EE	ю
143	217	8F	П	175	257	AF	п	207	317	CF	╧	239	357	EF	я
144	220	90	Р	176	260	B0	░	208	320	D0	╨	240	360	F0	Ё
145	221	91	С	177	261	B1	▒	209	321	D1	╤	241	361	F1	ё
146	222	92	Т	178	262	B2	▓	210	322	D2	╥	242	362	F2	Є
147	223	93	У	179	263	B3	│	211	323	D3	╙	243	363	F3	є
148	224	94	Ф	180	264	B4	┤	212	324	D4	╘	244	364	F4	Ї
149	225	95	Х	181	265	B5	╡	213	325	D5	╒	245	365	F5	ї
150	226	96	Ц	182	266	B6	╢	214	326	D6	╓	246	366	F6	Ў
151	227	97	Ч	183	267	B7	╖	215	327	D7	╫	247	367	F7	ў
152	230	98	Ш	184	270	B8	╕	216	330	D8	╪	248	370	F8	°
153	231	99	Щ	185	271	B9	╣	217	331	D9	┘	249	371	F9	•
154	232	9A	Ъ	186	272	BA	║	218	332	DA	┌	250	372	FA	·
155	233	9B	Ы	187	273	BB	╗	219	333	DB	▉	251	373	FB	┬
156	234	9C	Ь	188	274	BC	╝	220	334	DC	▄	252	374	FC	#
157	235	9D	Э	189	275	BD	╜	221	335	DD	▌	253	375	FD	¤
158	236	9E	Ю	190	276	BE	╛	222	336	DE	▐	254	376	FE	□
159	237	9F	Я	191	277	BF	┐	223	337	DF	▀	255	377	FF	

Accessing Cyrillic Characters

Russian language messages may be created and edited only within the offline programmer. There are two ways to generate Cyrillic characters using a standard IBM compatible keyboard. A full set of upper and lower case characters can be generated in the Edit Message and Create New Message screens of the offline programmer.

Using the Cyrillic character reference chart on the previous page, a character can be entered by holding down the [ALT] key while entering the decimal number corresponding to the desired character. Releasing the [ALT] key displays the normal corresponding extended ASCII character. When the message is downloaded to the DL40 Plus, the characters are converted to Cyrillic.

Note: The Cyrillic character set is only available on DL40 Plus Dataliner message displays. The offline programmer displays a warning message if you attempt to download a Cyrillic application to a standard DL40 message display.

International Character Set

To access the international character set, also called Latin Alphabet No.1, use the [ALT] key in combination with the numeric keypad section on your keyboard. Hold down the [ALT] key, then enter the 2-digit hexadecimal value found in the chart below. For example, to enter **&**, you would hold down [ALT] then enter the value **26**. The normal corresponding ASCII character is displayed in the offline message window when you release the [ALT] key. When you download the message file to the DL40 Plus, the characters are displayed in the international font. The international character set is not available with the onboard editor.

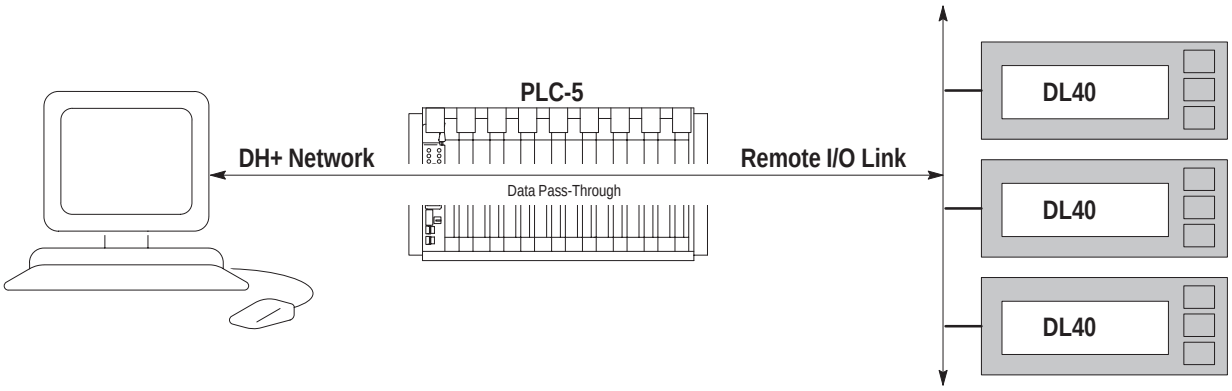
Note: The International character set is only available on DL40 Plus Dataliner message displays. The offline programmer displays a warning message if you attempt to download an International application to a standard DL40 message display.

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0			SP	0	@	P	‘	p			NBSP	°	À	Ð	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|			¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			SHY	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o				¯	¿	Ï	ß	ï	ÿ

PLC-5 Data Pass–Through

Overview

This appendix describes how to use the DL40 Plus PLC-5 Pass-Through option to transfer message files on a Data Highway (DH+) network. The PLC-5 transfers the data, there is no need to connect separate wiring between the DL40 and host computer. The following illustrates the Pass-Through function.



Message files can either be:

- Transferred from the DL40 to the host computer (Uploaded).
- Transferred from the host computer to the DL40 (Downloaded)

System Requirements

To use the Pass-Through option, you need:

- Series D or greater DL40
- Revision frn 2.00 or greater Offline Programming Software.

The Pass-Through function operates with the following PLC-5s:

Applicable PLC Types

PLC Type	Series	Minimum Revision Level
PLC-5/15	B	N
PLC-5/11	A	A
PLC-5/20	A	A
PLC-5/25	A	J
PLC-5/30	A	B
PLC-5/4O	A	E
PLC-5/6O	B	B
PLC-5/250	All	All

The host computer requires an interface card for the DH+ link. The following interface cards are available:

Interface Boards and Modules for Host Computer

Catalog Number	Description
1784-KTK 1	2 Slot Interface Board
1784-KT	$^1/_2$ Slot Interface Board
1784-KL	Interface Board for Allen-Bradley 1784-T45 or 1784-T47
1784-KF2	Interface Module for PC-AT or compatible
1784-PCMK/B	PCMCIA Type II interface card for PC compatible notebook computers.

Communications File Setup

Setup Communication files using the following Offline Programming Software screens:

- Download to DL40 (DH+ and Remote I/O) setup screens
- Upload from DL40 (DH+ and Remote I/O) setup screens

Note: The DL40 must be operating in Block Transfer mode when using the Pass-Through feature.

ATTENTION: Incorrect Address selection could corrupt data in a non-DL40 device. Verify that the correct Communication File is selected.

To access the setup parameters for file transfers, select the **Transfer** menu on the initial Main Menu screen as shown below.

↑	↓	Moves cursor to desired function.
	Home	Moves cursor directly to 1st function - **Download, etc.**
	End	Moves cursor directly to last function -**Quit**.
	CR	Selects function highlighted by cursor.
	F1	Help

Downloading Files

You can send only one file at a time to a DL40 Plus. Select the Transfer menu and highlight Download to DL40 (Remote I/O*)* function; press [↵]. The Download (Over Remote I/O) window opens. Select Message File to download and Communication File to use.

Highlight Download <filename> press [↵]. Answer Yes when asked if you want to Start Downloading Now?

Note: When downloading through Remote I/O, Download Type is automatically set to All. You can't just transfer Parameters.

Uploading Files

You can send only one file at a time from a DL40. Highlight Upload from DL40 (Remote I/O) function; press [↵]. The Upload (Over DH+ and Remote I/O) window opens. Select Message File to upload and Communication File to use.

Highlight Upload <filename> press [↵]. Answer Yes when asked if you want to Start Uploading Now?

Download to DL40 (Remote I/O) Submenu

Select **Download to DL40 (Remote I/O)** from the **Transfer** menu to set up a communications file for download data Pass-Through.

↑ ↓ Moves cursor to desired file.

Home or End Moves cursor to first or last file.

CR Accepts file to download.

Esc Returns to transfer screen. No download.

Upload from DL40 (Remote I/O Submenu)

Select **Upload (Remote I/O)** from the **Transfer** menu to set up an upload communications file for upload data Pass-Through

↑ ↓ Moves cursor to desired file.

Home or End Moves cursor to first or last file.

CR Accepts file to download.

Esc Returns to transfer screen. No download.

Creating a New Communications File

Select **Create Communications File** on the DH+ and Remote I/O upload or download menus to create a new communications file

When creating or modifying a communications file, you must provide the following:

DL40 Rack (Address) 0 to 76 (octal). The rack address assigned to the DL40 using DIP Switch Bank #1.

DL40 Group (Number) First I/O Group Number assigned to the DL40 using DIP Switch Bank #1 on the back of the DL40. Select: 0, 2, 4 or 6.

PLC Address 0 to 77 (octal). The station number of the PLC-5 on the DH+ link to which the DL40 is attached. This address must match the DIP switch settings on the PLC.

PLC Type Select: PLC-5/15, 25, 40, 60 or PLC-5/250. For PLC-5/11, 5/20 and 5/30, choose PLC Type = PLC-5/15, etc.

Programming Terminal Address 0 to 77 (octal). Station number for the programming terminal on the DH+ link.

DH+ Hardware Device You will have to provide additional data depending on the type of interface module.

Modifying Existing Communication Files

Select **Modify Communications File** on the Remote I/O upload or download menus to modify an existing communications file.

If you want to modify an already specified Communication File, highlight Select Communication File on the file Transfer menu. To modify a file from another directory, highlight Directory and press [CR] and the Program's Data Path window opens. Enter directory in the format:

Drive:\Directory

Press [↵]. The File Selections window opens. Highlight file you want to modify; press [↵]. **Note:** All Communication Files have the suffix .UDU.

Highlight Modify Configuration File in the Download window and press [↵]. The Communication File window opens.

Highlight parameter you want to modify and press [↵]. Select parameter setting and press [↵]. When you highlight DH + Hardware Device and press [↵] the <Device Type> window opens. Set device parameters.

After all parameters are set, highlight Quit and press [↵].

Setup Information

Refer to the following set up parameters, when setting up communications files.

1784-KL Interface Module Set Up Parameters

Use the following when setting up the Pass-Through function.

DH + Connection Type

Select: Direct if your programming computer and your PLC-5 are the only devices on the DH+ link or if there are multiple devices on the link and your programming computer **is** the first or last (physical) device on the link.

Select: Multi-Drop if there are multiple devices on the link and your programming computer **is not** first or last (physical) device on link.

DH + Network Access

Select: Local if the PLC to which the DL40 is attached is on the same DH+ link as your programming computer.

Select: Remote (Bridge) if the PLC to which the DL40 is attached is on a separate DH+ link (connected by Data Highway) from the DH+ link to which your programming computer is attached.

If you are using remote DH+ networks, you must also supply:

Local Bridge Address 0 to 376 (octal)

The Data Highway address that you assign to the 1785-KA Module connecting your computer's DH+ link to Data Highway. This address must match the DIP switch settings on the KA Module.

Remote Bridge Address 0 to 376 (octal)

The Data Highway address that you assign to the 1785-KA Module connecting your PLC-5's DH+ link to Data Highway. This address must match the DIP switch settings on the KA Module.

1784-KT Interface Module Set Up Parameters

Use the following when setting up the Pass-Through function.

DH + Connection Type

Select: Direct if your programming computer and your PLC-5 are the only devices on the DH+ link or if there are multiple devices on the link and your programming computer **is** the first or last (physical) device on the link.

Select: Multi-Drop if there are multiple devices on the link and your programming computer **is not** first or last (physical) device on link.

KT Address

The bit address that you assign to the 1784-KT Module using the DIP switch on the module.

DH + Network Access

Select: Local if the PLC to which the DL40 is attached is on the same DH+ link as your programming computer.

Select: Remote (Bridge) if the PLC to which the DL40 is attached is on a separate DH+ link (connected by Data Highway) from the DH+ link to which your programming computer is attached.

If you are using remote DH+ networks, you must also supply:

Local Bridge Address 0 to 376 (octal)

The Data Highway address that you assign to the 1785-KA Module connecting the DH+ link containing your programming computer to Data Highway. This address must match the DIP switch settings on the module.

Remote Bridge Address 0 to 376 (octal)

The Data Highway address that you assign to the 1785-KA Module connecting the DH+ link containing your PLC-5 (to which the DL40 is attached) to Data Highway. This address must match the DIP switch settings on the module.

1784-KTK1 Interface Module Set Up Parameters

Use the following when setting up the Pass-Through function.

DH + Connection Type

Select: Direct if your programming computer and your PLC-5 are the only devices on the DH+ link or if there are multiple devices on the link and your programming computer **is** the first or last (physical) device on the link.

Select: Multi-Drop if there are multiple devices on the link and your programming computer **is not** the first or last (physical) device on the link.

KTK1 Address

The bit address that you assign to the 1784-KTK1 Module using the DIP switch on the module.

KTK1 Interrupt

The interrupt that you assign to the 1784-KTK1 Module using the jumper on the module. The factory setting for this interrupt is IRQ5.

1770-KF2 Interface Module Set Up Parameters

Use the following when setting up the Pass-Through function.

Configure Port

The computer port to which the KF2 Module is attached.

Select:	COM1 or COM2
Baud Rate	300, 600, 1200, 2400, 4800, 9600
Parity	None, Even, Odd
Duplex	Half, Full
Error Checking	CRC, BCC

These parameters must match the settings for the KF2 Module.

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